LOOP-E™ CSU/DSU
MODEL 1500-2S
(Stand Alone with Inband)
USER'S MANUAL

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Compliance with :

(1) EMC

EMI : EN50081-1

EN55022 (Conduction & Radiation) Class A

EMS : EN50082-1

IEC801-2 (ESD, 8KV)

ESD: ElectroStatic Discharge Test

IEC801-3 (R/S, 27MHZ~500MHZ, 3V/M)

R/S: Radiated Susceptibility Test

IEC801-4 (EFT, 1KV)

EFT: Power, Line/Date, Line Nose Test

(2) SAFETY

EN 60950

CAUTION:

- **Never install telephone wiring during a lightning storm.**
- **Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.**
- **Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.**
- **Use caution when installing or modifying telephone lines.**

Standard Lists

Loop-E™ E1 is designed to meet the following standards:

- **ITU G.703, G.704, G.706, G.732, G.736, G.823, ETSI ETS 300420, and ETS300419.**

1. PRODUCT DESCRIPTION

1.1 Description

Loop-E E1 is a family of intelligent Fractional E1 Channel Service Unit and Data Service Unit E1500 products. This product family provides E1 network interface, DS0 channel multiplexing, and direct connections to data, and video DTE (Data Terminal Equipment). This manual applies only to the Stand-Alone model.

Loop-E 1500 CSU/DSU can be configured via a front panel interface, local terminal (RS-232) control, or through the use of a Simplified Network Management Protocol (SNMP) management system.

1.2 Applications

The Loop-E 1500 CSU/DSU application example is illustrated in the following figure. Via DACS (Digital Access Cross-Connect System), the Loop-E interfaces various applications such as LAN (Local Area Network) to WAN (Wide Area Network) communications, Host to workstation communications, video conferencing and data communication of PBXs (Private Branch Exchanges). This allows the user to integrate different application into a single communication link and utilizing only part of the available bandwidth. Furthermore, this allows the user to expand bandwidth, up to 31 DS0 channels, on demand without additional physical links because they are already available. Data and video applications may include equipment such as video conferencing, bridge, router, gateway, workstation, host computer, and various high-speed data terminal equipment. Figure 1-2 to Figure 1-4 illustrates some of these applications.

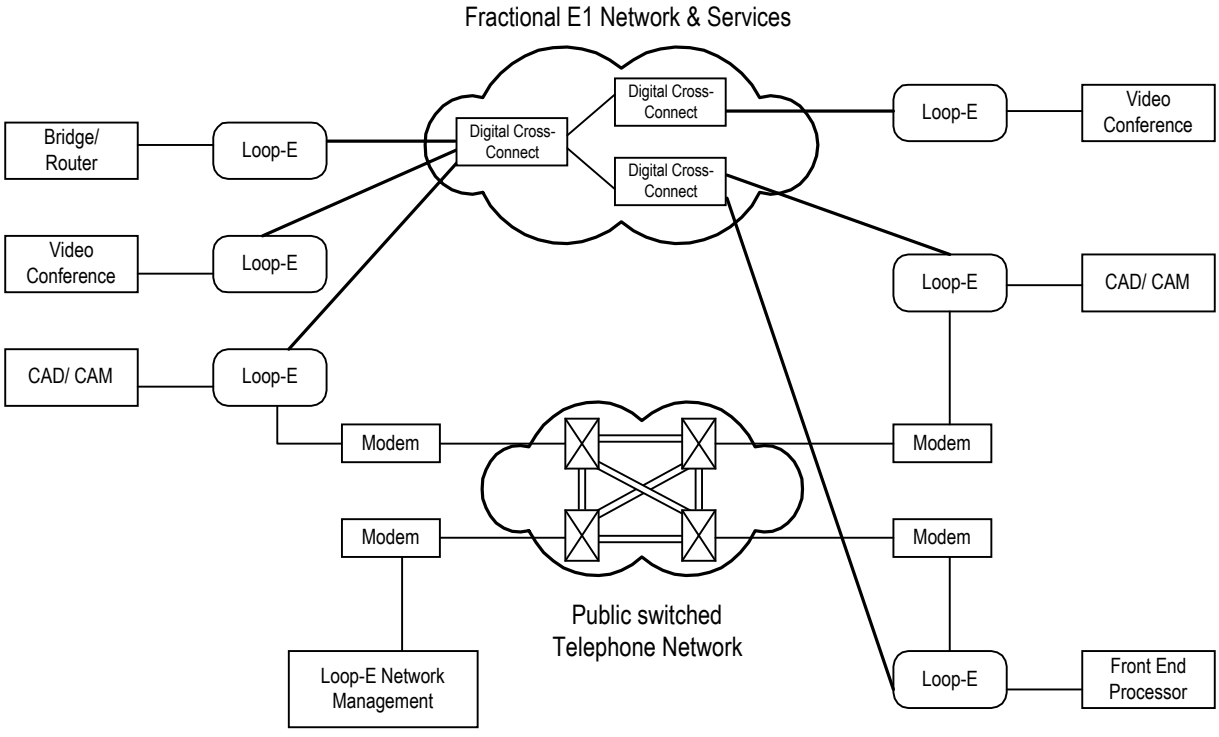


Figure 1- 1 Application Illustration - 1

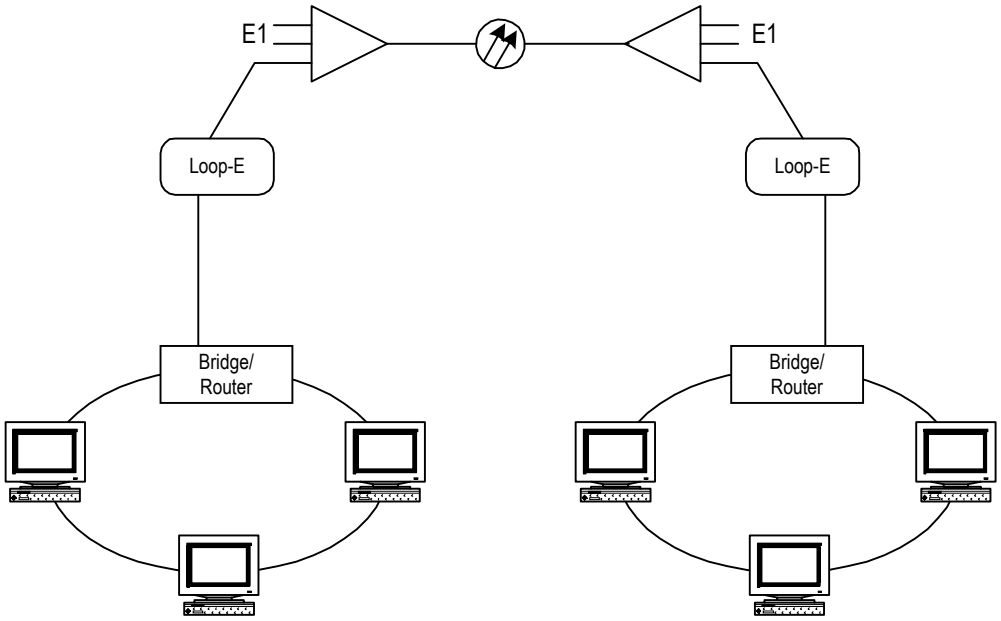


Figure 1- 2 Application Illustration - 2

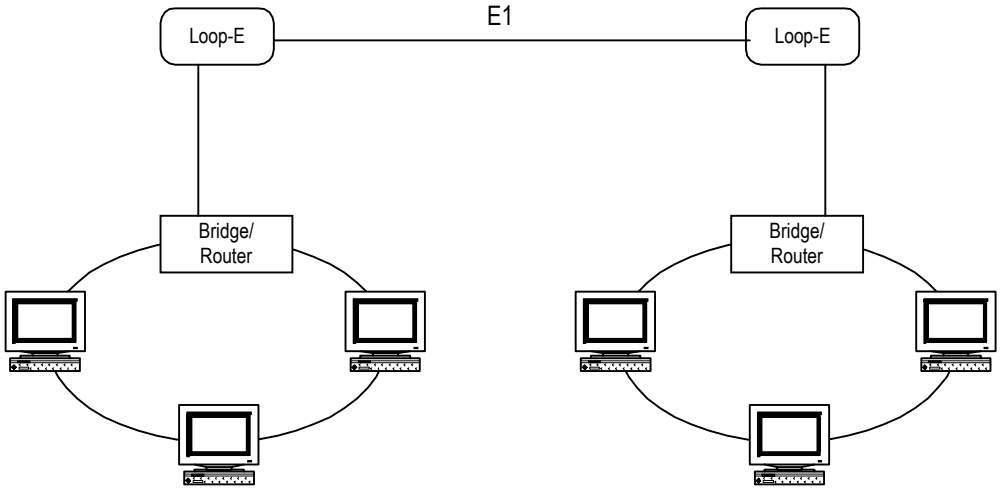


Figure 1- 3 Application Illustration - 3

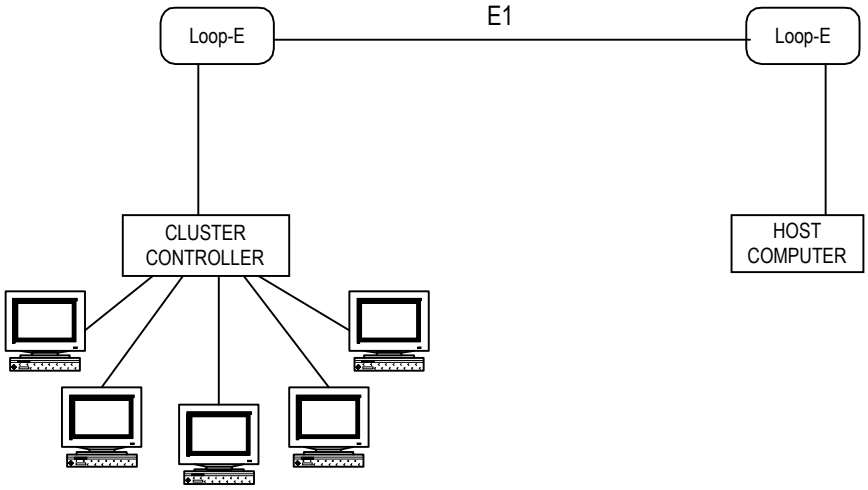


Figure 1- 4 Application Illustration - 4

1.3 Specifications

Line Interface (E1 Interface) - Network & Customer

Line Rate	2.048 Mbps ± 50 ppm
Line Code	AMI / HDB3 (selectable)
Input Signal	ITU G.703
Jitter	ITU G.823
Framing	ITU G.704
Connector	BNC, RF-coaxial, RJ48C (specify on order)
Output Signal	ITU G.703
Electrical	75Ω Coax/120Ω twisted pair

Serial DTE Port

Data Port	Single DTE
Data Rate	n * (56 or 64) Kbps (n = 1 - 31)
Connector	M34 for V.35 DB25S for V.35, RS232, and EIA530 DB9S for X.21 DB37 for RS449 via conversion cable

Router Interface

Number of ports	2
Physical Interface	10/100 BaseT x 1
Connector	RJ45
Routing Protocol	RIP-I, RIP-II
Data Rates	N x 64 Kbps up to E1 capacity
Supporting Protocols	TCP/IP, PPP, NAT
Management	VT-100, SNMP, LCD Panel

Co-directional Interface

Interface	ITU G.703 64 Kbps co-directional interface
Connector	120ohm, RJ48
Line Distance	Up to 500 meters
Loopback	DTE Payload Loopback, DTE to Line Loopback

DS0 Mapping

Maps	2 sets of DS0 maps with provision for timed automatic switching between the 2 maps
Remote Send	Send active DS0 maps to remote site

Inband Management

Management Protocols	HDLC, PPP, FR
Channel	Channel selectable

Clear Channel (Unframed Option)

Data Rate	2048 Kbps

Performance Monitor

Performance Store	Last 24 hours performance in 15-minute intervals and last 7 days in 24-hour summary line, user, and remote site
Performance Reports	Date & Time, Errored Second, Degraded Minutes, Unavailable Second, Bursty Errored Second, Severe Errored Second, Controlled Slip Second, and Loss of Frame Count
Alarm History	Date & Time, Alarm Type (i.e. Master Clock Loss, RAI, AIS, LOS, BPV, ES, CSS), and Location (i.e. line, DTE)
Alarm Queue	Maximum 40 alarm records which record the latest alarm type, location, and date & time
Threshold	Bursty Seconds, Severely Errored Second, Degraded Minutes

System Configuration Parameters (All in non-volatile memory)

Active Configuration	Current working configuration
Stored Configuration	User stored configuration
Default Configuration	Manufacture default configuration (permanent)

Console Port

Connector	DB9S at front panel
Electrical	RS232 interface
Protocol	Menu driven VT-100 terminal, or Embedded SNMP (optional)
Baud Rate	1200, 2400, 4800, 9600, 19200, 38400

Diagnostics Test

Loopbacks	Line Loopback, Payload Loopback, Local Loopback, DTE Loopback, and Router Loopback
Test Pattern	15-bit PRBS, 3-in-24, 1-in-8, 2-in-8, 1:1 patterns
Idle Channel	Use of idle channel to perform PRBS diagnostic test
Remote Loopback	Line Loopback, Payload Loopback, and DTE Channel Loopback (V.54 or Loop proprietary)

Front Panel

Keypad	4-key: left arrow, right arrow, ESC, and ENTER
LCD	2 lines by 16 characters
LED Indicators	

Physical/Electrical

Dimensions	22 x 6 x 29 cm (WxHxD)
Power	100-240Vac, 20 to 60 Vdc, 50/60 Hz, 5 watts
Temperature	0 -50°C
Humidity	0-95% RH (non-condensing)
Mounting	Desk-top stackable

Compliance

ETSI	ETS 300420, ETS 300419
ITU	G.703, G.704, G.706, G.732, G.736, G.823, G.826
EMI/EMC	EN50082-1, EN55022 Class A
Safety	EN60950

2. INSTALLATION

CAUTION:

- **Never install telephone wiring during a lightning storm.**
- **Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.**
- **Never touch un-insulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.**
- **Use caution when installing or modifying telephone lines.**

2.1 Site Selection

The following are guidelines for site selection. These guidelines must be followed to ensure a proper installation site.

- The installation site should have an AC power receptacle.
- The following are the maximum suggested cable lengths:

1.	E1	1200m	(3996 ft)
2.	V.35	60m	(200 ft)
3.	RS449	60m	(200 ft)
4.	RS232	15m	(50 ft)
5.	EIA530	60m	(200 ft)
6.	X.21	60m	(200 ft)
7.	Ethernet	100m	(333 ft)

NOTE: If longer distance is desirable, a lower than maximum speed with proper cabling and grounding is advisable. For more information, please contact Loop Service Representative.

- The installation site should provide space for adequate ventilation and cable routing. Reserve at least 12 cm (5 inches) at the rear of the unit for cables and air flow.
- The site should provide a stable environment. The operating area should be clean and free from extremes of temperature, humidity, shock, and vibration.
- Relatively humidity should stay between 0 and 95%. Do not operate the unit at an altitude greater than 3000 meters (10,000 feet).

2.2 Mechanical and Electrical Installation

2.2.1 Mechanical Installation

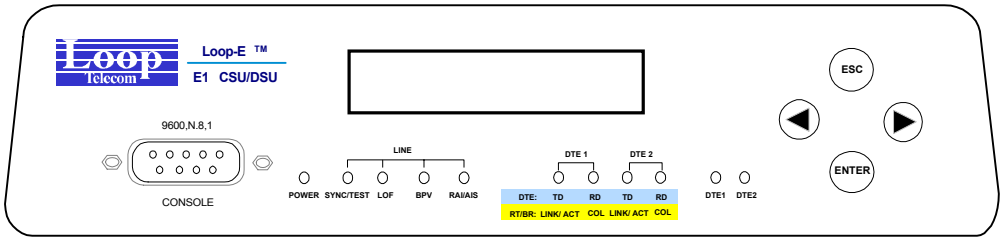


Figure 2- 1 Loop-E 1500 Front Panel View

Loop-E 1500 CSU/DSU Stand-Alone version is a desk top unit, which is stackable. The front panel is shown in Figure 2-1, and the rear panels are shown in Figure 2-2 and Figure 2-3.

NOTE: AC power frequency range is 47 - 63Hz.

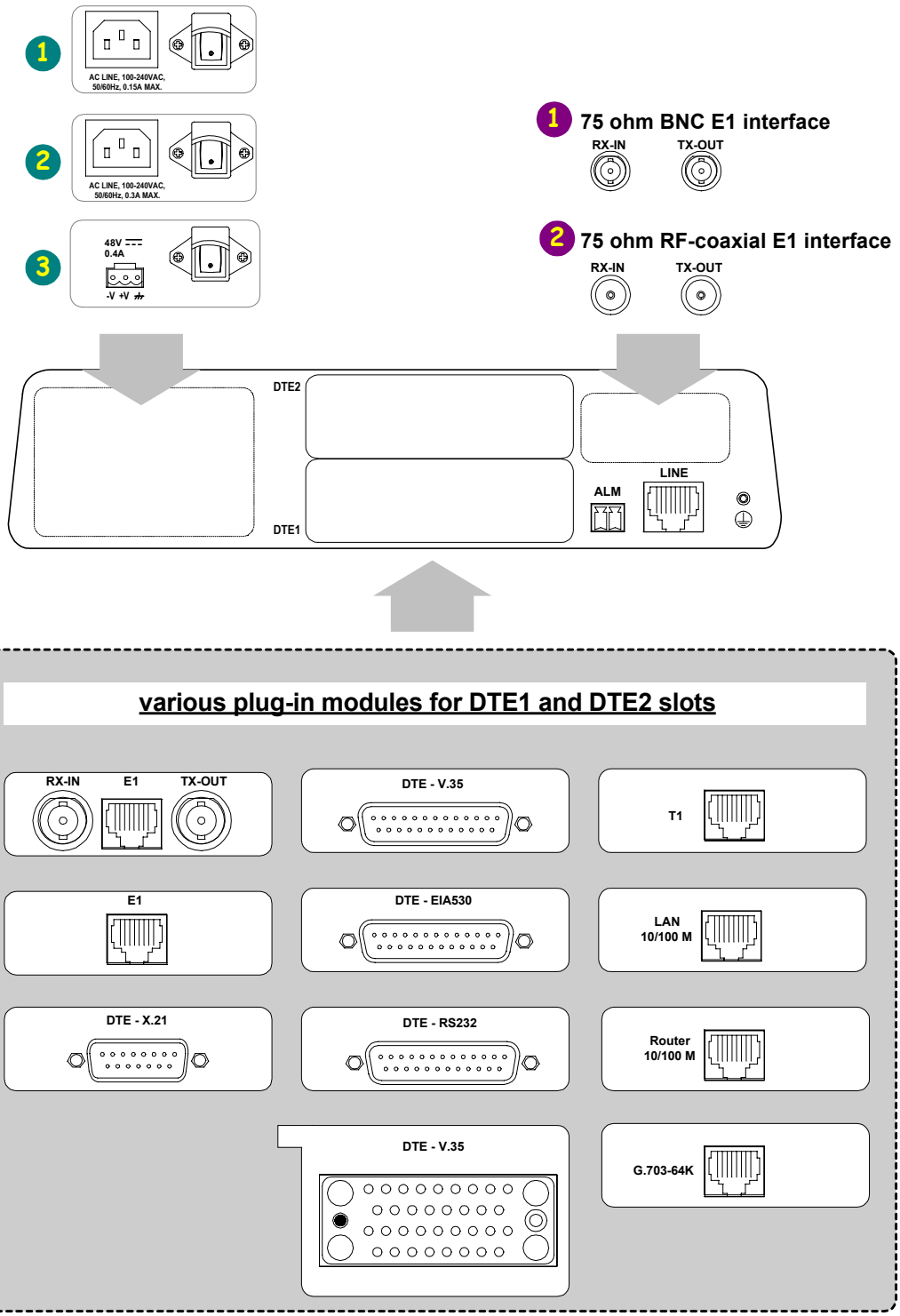


Figure 2- 2 Rear Panels View

NOTE: – For jumper setting of LINE (TP), see also Table 2-1 A. with Figure 2-3.
– For jumper setting of LINE (BNC), see also Table 2-1 A. with Figure 2-4.
– For jumper setting of E1(TP)(DTE1), see also Table 2-1 B. with Figure 2-3, and Table 2-2 with Figure 2-5.
– For jumper setting of E1(BNC)(DTE1), see also Table 2-1 B. with Figure 2-4, and Table 2-2 with Figure 2-5.
– For jumper setting of E1(TP)(DTE2), see also Table 2-1 B. with Figure 2-3, and Table 2-2 with Figure 2-5.
– For jumper setting of E1(BNC)(DTE2), see also Table 2-1 B. with Figure 2-4, and Table 2-2 with Figure 2-5.

Table 2- 1 Jumper Setting for Main Board

A. Configuration for Main Board

Impedance Selection of Line E1, TP (120 ohm)		Impedance Selection of Line E1, BNC (75 ohm)	
JP9	1, 2	**JP9**	2, 3
JP10	Not used	**JP10**	BNC output of Rx is connected to shield ground
JP11	2, 3	**JP11**	1, 2
JP12	2, 3	**JP12**	1, 2
JP13	2, 3	**JP13**	1, 2
JP14	PIN 7 and PIN 8 of RJ connector is connected to shield ground	**JP14**	Not used
JP15	2, 3	**JP15**	1, 2
JP23	Not used	**JP23**	BNC output of Tx is connected to shield ground

JP2	JP3	Interface Type Selection of Line
ON	ON	E1 (BNC)
ON	OFF	E1 (TP)
OFF	ON	T1 (Reserved)
OFF	OFF	J1 (Reserved)

B. Configuration for E1 Daughter Board

JP35	JP36	Interface Type Selection of E1 (DTE1)
ON	ON	E1 (BNC)
ON	OFF	E1 (TP)
OFF	ON	T1 (Reserved)
OFF	OFF	J1 (Reserved)
JP37	**JP38**	**Interface Type Selection of E1 (DTE2)**
ON	ON	E1 (BNC)
ON	OFF	E1 (TP)
OFF	ON	T1 (Reserved)
OFF	OFF	J1 (Reserved)
JP20	**JP25**	Reserved

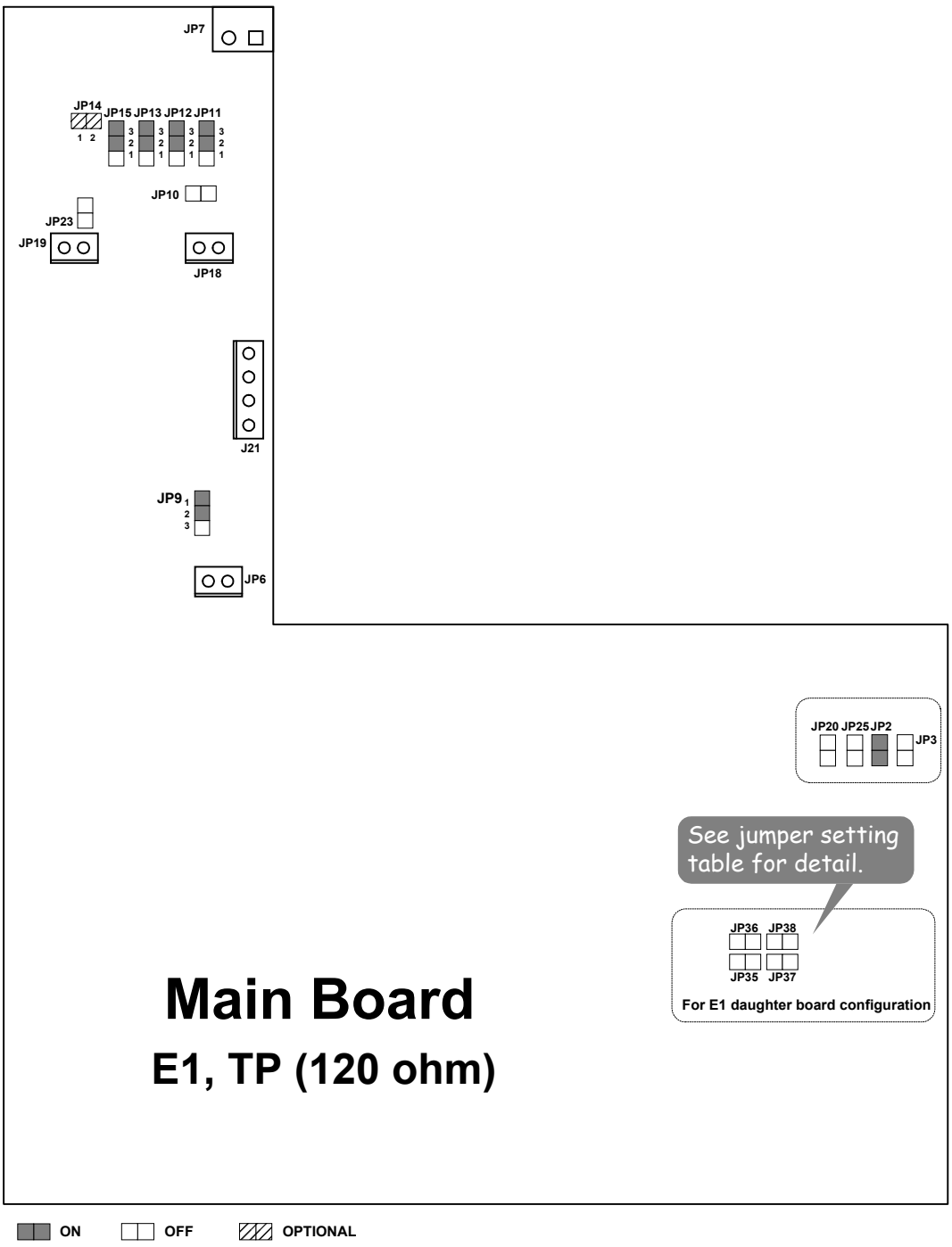


Figure 2- 3 Main Board Jumper Setting of Line - E1, TP (120 ohm)

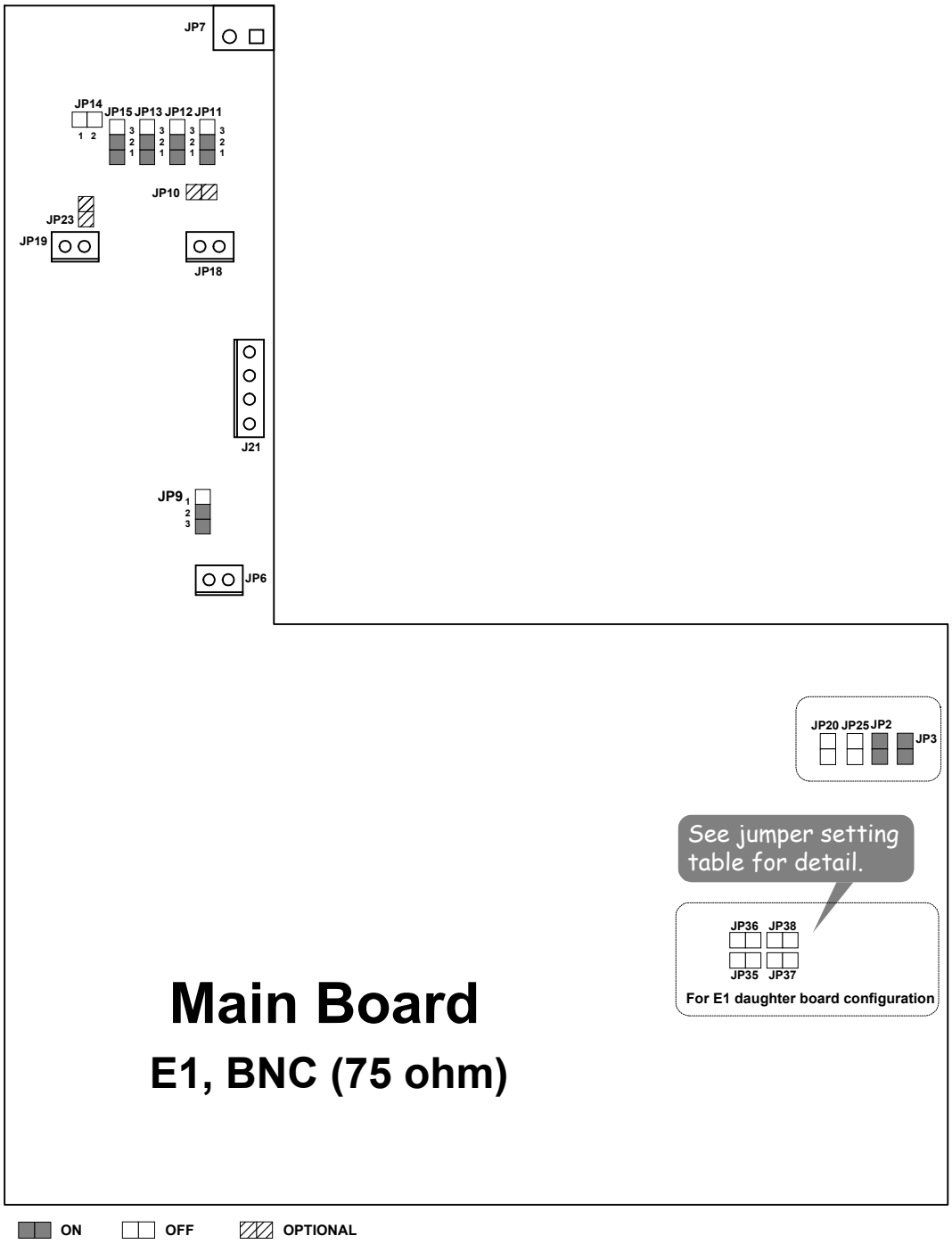


Figure 2- 4 Main Board Jumper Setting of Line - E1, BNC (75 ohm)

Table 2- 2 Jumper Setting for E1 Daughter Board

E1, TP (120 ohm)		E1, BNC (75 ohm)	
JP1	1, 2	**JP1**	2, 3
JP2	Not used	**JP2**	Optional, Shield ground
JP3	2, 3	**JP3**	1, 2
JP4	2, 3	**JP4**	1, 2
JP5	2, 3	**JP5**	1, 2
JP6	Optional, Shield ground	**JP6**	Not used
JP7	2, 3	**JP7**	1, 2
JP8	1, 2	**JP8**	1, 2
JP9	Not used	**JP9**	Optional, Shield ground

NOTE: When BNC connector is selected, the user has the option of grounding the received BNC shield by installing a jumper clip on the jumper location. **This is usually not necessary, but if you have any noise on your device it can often be filtered out by using this grounding process.**

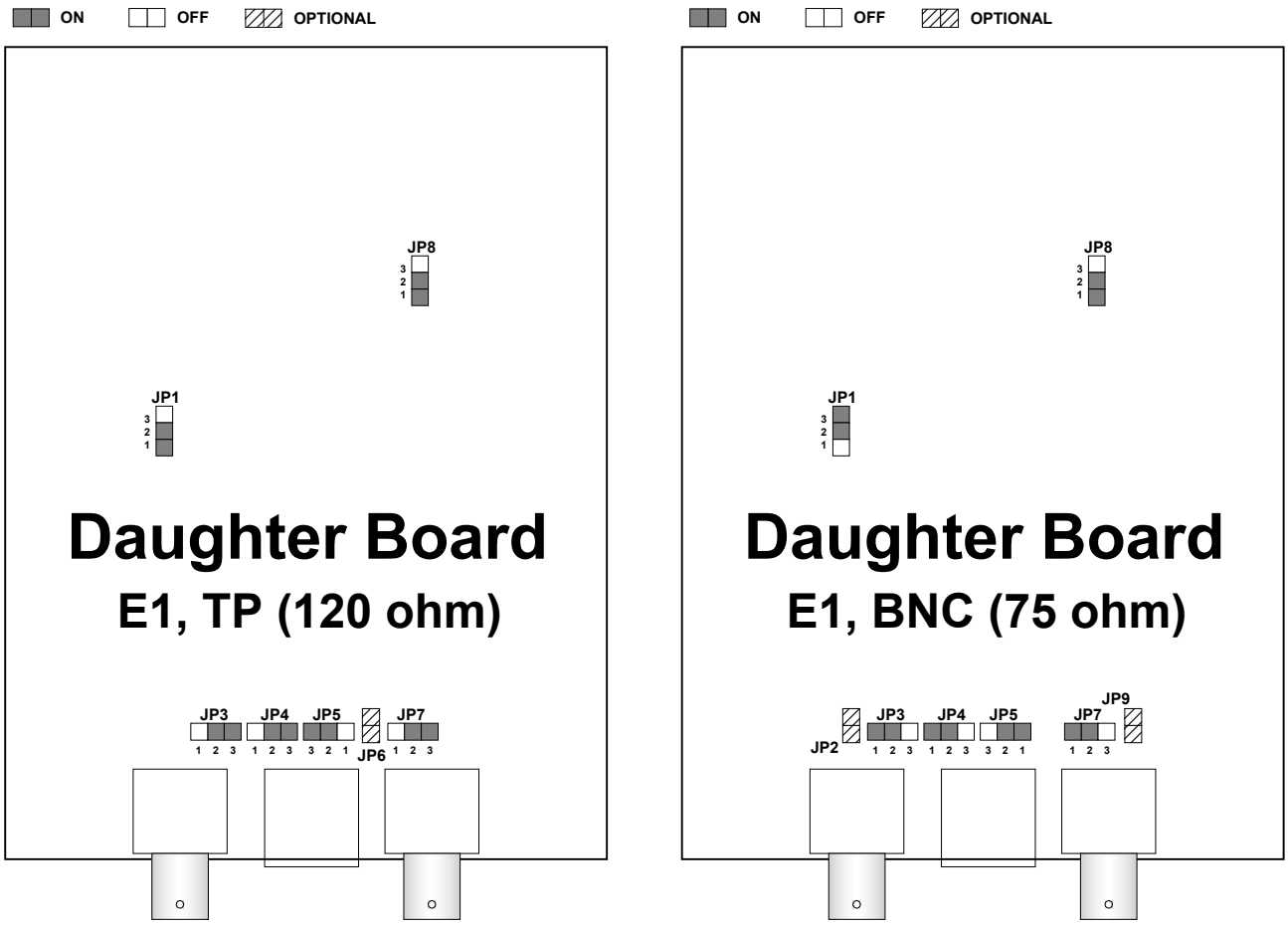


Figure 2- 5 Daughter Board Jumper Setting - E1

2.2.2 Electrical Installation

Loop-E 1500 CSU/DSU Stand-Alone version is AC powered. Use the rear right power connector to connect to an AC power outlet.

For connection to a VT100 type terminal for maintenance and administration, a console port with DB9 connector is located on the front panel. For remote terminal connection through a modem, an adapter cable from DB9 to DB25 must be used. The console port is configured as a DCE device. It is designed to match to DB9 PC COM PORT of most lap-top computers.

Table 2- 3 DB9S Console Port

Pin Number	Signal	Source
1	Data Carrier Detect	To DTE
2	Receive Data	To DTE
3	Transmit Data	From DTE
4	Unassign	
5	Singal Ground	
6	Data Set Ready	To DTE
7	Unassign	
8	Clear to send	To DTE
9	Unassign	

Network connection is supported by RJ48 or BNC connector. The line interface is labeled with LINE. RJ48 connector pin definition is listed in Table 2-4.

Table 2- 4 RJ48 Line Connector

Pin Number	Signal	Signal Direction
1	Receive Ring	From E1 Network
2	Receive Tip	From E1 Network
3	Unassigned	
4	Transmit Ring	To E1 Network
5	Transmit Tip	To E1 Network
6	Unassigned	
7	Shield Ground	
8	Shield Ground	

The DTE port is configured as a DCE device. There are 6 different DTE boards: V.35/M34, V.35/DB25, EIA530/DB25, X.21/DB15, RS232/DB25, and RS449/DB37. Pin definitions are defined in the following tables.

Note:

For the case of balanced twisted pair interface, if the transmit and receive pairs have shields, then only one end of the shields should be connected to earth. If the near end is selected for grounding the shields, the two shield pairs on the RJ48 connector can be used for this purpose.

The RJ45 jacks are wired as follows:

Table 2- 5 RJ-45 for 10/100M Pin Assignment

Pin Number	Signal	Signal Direction
1	Transmit Data +	Output from LOOP-E
2	Transmit Data -	Output from LOOP-E
3	Receive Data +	Input to LOOP-E
4	No Connection	
5	No Connection	
6	Receive Data -	Input to LOOP-E
7	No Connection	
8	No Connection	

Table 2- 6 G.703 64Kbps Pin Assignment

Pin Number	Signal
1	Receive Ring
2	Receive Tip
3	Unassigned
4	Transmit Ring
5	Transmit Tip
6	Unassigned
7	Unassigned
8	Unassigned

Table 2- 7 V.35/M34 DTE Port Pin Definition

Pin Number	Signal	Source
A	Cable Shield	
B	Signal Ground	
C	Request To Send	DTE
D	Clear To Send	DCE
E	Data Set Ready	DCE
F	Data Carrier Detect	DCE
H	Data Terminal Ready	DTE
J	Unassigned	
K	Unassigned	
L	Local Loopback	DTE
M	Unassigned	
N	Remote Loopback	DTE
P	Transmit Data	DTE
R	Receive Data	DCE
S	Transmit Data Return	DTE
T	Receive Data Return	DCE
U	External Clock	DTE
V	Receive Clock	DCE
W	External Clock Return	DTE
X	Receive Clock Return	DCE
Y	Transmit Clock	DCE
Z	Unassigned	
AA	Transmit Clock Return	DCE
BB	Unassigned	
CC	Unassigned	
DD	Unassigned	
EE	Unassigned	
FF	Unassigned	
HH	Unassigned	
JJ	Unassigned	
KK	Unassigned	
LL	Unassigned	
MM	Unassigned	
NN	Test Mode	DCE

Table 2- 8 V.35/DB25 DTE Port Pin Definition

Pin Number	Signal	Source
1	Cable Shield	
2	Transmit Data	DTE
3	Receive Data	DCE
4	Request To Send	DTE
5	Clear To Send	DCE
6	Data Set Ready	DCE
7	Signal Ground	
8	Data Carrier Detect	DCE
9	Receive Clock Return	DCE
10	Unassigned	
11	External Clock Return	DTE
12	Transmit Clock Return	DCE
13	Unassigned	
14	Transmit Data Return	DTE
15	Transmit Clock	DCE
16	Receive Data Return	DCE
17	Receive Clock	DCE
18	Unassigned	
19	Unassigned	
20	Data Terminal Ready	DTE
21	Unassigned	
22	Unassigned	
23	Unassigned	
24	External Clock	DTE
25	Unassigned	

Table 2- 9 EIA530/DB25 DTE Port Pin Definition

Pin Number	Signal	Source
1	Cable Shield	
2	Transmit Data	DTE
3	Receive Data	DCE
4	Request To Send	DTE
5	Clear To Send	DCE
6	Data Set Ready	DCE
7	Signal Ground	
8	Data Carrier Detect	DCE
9	Receive Clock Return	DCE
10	Data Carrier Detect Return	DCE
11	External Clock Return	DTE
12	Transmit Clock Return	DCE
13	Clear To Send Return	DCE
14	Transmit Data Return	DTE
15	Transmit Clock	DCE
16	Receive Data Return	DCE
17	Receive Clock	DCE
18	Local Loopback	DTE
19	Request To Send Return	DTE
20	Data Terminal Ready	DTE
21	Remote Loopback	DTE
22	Data Set Ready Return	DCE
23	Data Terminal Ready Return	DTE
24	External Clock	DTE
25	Test Mode	DCE

Table 2- 10 X.21/DB15 DTE Port Pin Definition

Pin Number	Signal	Source
1	Cable Shield	
2	Transmit Data	DTE
3	Control	DTE
4	Receive Data	DCE
5	Indication	DCE
6	Signal Timing	DCE
7	External Clock	DTE
8	Signal Ground	
9	Transmit Data Return	DTE
10	Control Return	DTE
11	Receive Data Return	DCE
12	Indication Return	DCE
13	Signal Timing Return	DCE
14	External Clock Return	DTE
15	Unassigned	

Table 2- 11 RS232/DB25 DTE Port Pin Definition

Pin Number	Signal	Source
1	Cable Shield	
2	Transmit Data	DTE
3	Receive Data	DCE
4	Request To Send	DTE
5	Clear To Send	DCE
6	Data Set Ready	DCE
7	Signal Ground	
8	Data Carrier Detect	DCE
9	Unassigned	
10	Unassigned	
11	Unassigned	
12	Unassigned	
13	Unassigned	
14	Unassigned	
15	Transmit Clock	DCE
16	Unassigned	
17	Receive Clock	DCE
18	Local Loopback	DTE
19	Unassigned	
20	Data Terminal Ready	DTE
21	Remote Loopback	DTE
22	Unassigned	
23	Unassigned	
24	External Clock	DTE
25	Test Mode	DCE

Table 2- 12 RS449/DB37 DTE Port Pin Definition

Pin Number	Signal	Source
1	Cable Shield	
2	Unassigned	
3	Unassigned	
4	Transmit Data	DTE
5	Transmit Clock	DCE
6	Receive Data	DCE
7	Request To Send	DTE
8	Receive Clock	DCE
9	Clear To Send	DCE
10	Local Loopback	DTE
11	Data Set Ready	DCE
12	Data Terminal Ready	DTE
13	Data Carrier Detect	DCE
14	Remote Loopback	DTE
15	Unassigned	
16	Unassigned	
17	External Clock	DTE
18	Test Mode	DCE
19	Signal Ground	
20	Unassigned	
21	Unassigned	
22	Transmit Data Return	DTE
23	Transmit Clock Return	DCE
24	Receive Data Return	DCE
25	Request To Send Return	DTE
26	Receive Clock Return	DCE
27	Clear To Send Return	DCE
28	Unassigned	
29	Data Set Ready Return	DCE
30	Data Terminal Ready Return	DTE
31	Data Carrier Detect Return	DCE
32	Unassigned	
33	Unassigned	
34	Unassigned	
35	External Clock Return	DTE
36	Unassigned	
37	Unassigned	

2.3 Configuration Setting

2.3.1 Hardware Configuration Setting

All configurations are software programmable. No DIP switches are available. Users should not need to open the case for modifications.

2.3.2 Software Configuration Setting

There are three system configurations:

- Factory default
- Current working
- User-stored

Factory default configurations are not changeable. Each Loop-E 1500 CSU/DSU is shipped with all three configurations set to the factory default configuration.

The current working configuration can be changed at any time. The system automatically stores the current working configuration into nonvolatile memory. When the system is turned off and then turned back on again, the previous working configuration is retrieved as the current working configuration.

The current working configuration may also be saved into nonvolatile memory as a user-stored configuration. The user-stored configuration may be retrieved at any time. Retrieving the user-stored configuration overwrites the current working configuration. The user can view the stored configuration in the System Setup Report [C] before retrieving it.

Procedure for Loading Default:

1. Power-up the unit, press and keep the ESC key until the the following LCD screen shows up.

2. Verify that LOAD DEFAULT is being displayed on the front panel to indicate that the operation was successful.

Procedure for switching Flash Bank:

1. Power-up the unit, press and keep the left and right arrow keys

Table 2- 13 Default Software Configuration

Console Port	Default
Baud Rate	9600
Data Bit	8
Stop Bit	1
Parity Bit	NONE
XON-XOFF	OFF
Interface	TERMINAL

E1 Line Item	Default
Code	HDB3
CRC	ON
RAI	ON
FDL	FDL
Idle Code	0 x d5
Frame	ON
S bit	Sa4
CAS	OFF
E bit	ON

DTE Port	Default
Rate	64KxN
Clock	NORMAL
Data	NORMAL
RTS	ACTIVE
TTM	OFF
V54	OFF
RL	OFF
LL	OFF

Router Port	Default
LAN IP Address	000.000.000.000
LAN Subnet Mask	000.000.000.000
WAN IP ADDRESS	000.000.000.000
WAN SUBNET MASK	000.000.000.000
DEFAULT GATEWAY	000.000.000.000
B/R Mode	Route

Active Map	Default
MAP1	all idle
MAP2	all idle
Switch MAP1: MAP2:	(00:00 - 12:00) (12:00 - 00:00)
Master Clock	Line Clock
2nd Clock	Line Clock
Password	Disable

Alarm Threshold	Default
Alarm Enable	Disable
Alarm Dial-out	Disable
BPV, Line	10E- 5
ES, Line	1
UAS, Line	1
CS, Line	1

Miscellaneous Items	Default
Password	LOOP
Device Name	LOOP-E 1500-2S
My IP Address	000.000.000.000
TRAP IP Address	255.255.255.255
Subnet Mask	000.000.000.000
Gateway IP	000.000.000.000

3. OPERATION

This chapter describes the Loop-E 1500 CSU/DSU configuration options and operational functions. User should refer to Chapter 5: Front Panel Operation And Chapter 6: Terminal Operation for detailed operational procedures.

3.1 Quick Start for Loop-E 1500 CSU/DSU

After installation, the user may want to familiarize with the equipment immediately. The following abbreviated instructions will give the user a quick start.

3.1.1 Power On

Turn power on by attaching power cable at the rear of the unit and then push ON/OFF switch. On the LCD, unit will first display SELF TEST followed by the main menu.

3.1.2 Return to Default Setting

Please refer to section 2.3.2 Software Configuration Setting for the detail.

3.1.3 Using Front Panel

To use the front panel to configure the unit, use the four keys to the right of the LCD. The menu is tree structured, with the main menu at the root of the tree. The ESC key brings the user towards to root. The ENTER key is used (a) to descend to branches of the menu, or (b) to confirm a selection. The left and right arrow keys is used to move the selection left or right.

3.1.3.1 Review of Default Settings

All the default settings can be reviewed or changed. This is done by selecting the menu item. Either a sub-menu is shown or the selected setting is indicated with an asterisk.

3.1.3.2 Line

After power up, the main menu is set to configuration. Press ENTER to go to sub-menus. Use arrow keys to select LINE. Then press ENTER. Under LINE, further sub-menus can be selected. For each sub-menu, the default LINE parameters are shown. The actual settings are shown for each parameter, which can be changed by arrow keys.

To change the settings, use ENTER key to select the parameter, use arrow key to select the new setting, and then press ENTER again. If ESC is pressed before ENTER, the setting will not be changed.

3.1.3.3 DTE

To review or change DTE settings, use arrow keys to display DTE-1. Then press ENTER. The default DTE parameters are shown. The actual settings are shown for each parameter, which can be selected by arrow keys.

To change the settings, use ENTER key to select the parameter, use arrow key to select the new setting, and then press ENTER again. If ESC is pressed before ENTER, the setting will not be changed.

3.1.3.4 Map Setup

To review or change MAP settings, use arrow keys to display DS0-MAP. Then press ENTER. The current active map is indicated.

To review or change MAP1 settings, use arrow keys to move cursor to MAP1. Then press ENTER. The current active map is indicated.

To change the settings, use ENTER key to select MAP1, use arrow key to select the DS0 channel number for new assignment, and then press ENTER again. Then select IDLE, DTE, etc., for the new channel assignment. Press ENTER. If ESC is pressed before ENTER, the setting will not be changed.

3.1.4 Using Terminal

To use the RS232 interface to configure the unit, connect a VT-100 terminal to the RS232 connector. The VT-100 terminal can be a PC running a VT-100 emulator software. The unit is configured as a DCE.

Upon connection, press ENTER and ESC alternately to bring the main menu into view.

Press “O” (Log On) to see the full menu.

Press “S” (System Setup) to review or change the configuration.

3.1.4.1 Review of Default Settings

The entire configuration is shown when S is pressed. To change any setting, use the arrow keys to move to the target setting. Then press the TAB key repeatedly to cycle to the desired setting for any selected parameter.

3.1.4.2 Line

Use arrow keys to move cursor to the target LINE parameter. Then use TAB key to change the parameter setting. When satisfied, press ESC. Confirm with Y (yes).

3.1.4.3 DTE

Use arrow keys to move cursor to the target DTE parameter. Then use TAB key to change the parameter setting. When satisfied, press ESC. Confirm with Y (yes).

3.1.4.4 Map Setup

Use arrow keys to move cursor to the target MAP parameter. Then use TAB key to change the parameter setting.

When satisfied, press ESC. Confirm with Y (yes).

3.2 System Operation

3.2.1 Date

This product is equipped with a RTC (Real Time Clock). User can change the current date and time as necessary. The RTC is activated by the manufacturer before shipping. This is to save RTC battery life. The RTC battery has a 10 years power off life cycle.

3.2.2 Master Clock

This product has a system clock PLL (Phase Lock Loop) which may be phase locked to the E1 line clock, DTE clock, or internal clock. The E1 line clock and internal clock are all 2.048 Mbps. The DTE clock is either 56KxN or 64KxN bps (N is 1 to 31) as per the DTE rate configuration. The default master and 2nd clock source are the E1 line clock.

When the master clock source is lost, the system will automatically switch to the 2nd clock source. This is to provide an alternative clock source when the primary clock source is lost. The current active clock source is shown by the LCD "MCLK"" command and terminal "S" and "C" commands.

NOTE: If a 2nd clock source is not available, the user MUST set the 2nd clock source and master clock source to the same value. If the 2nd clock source is lost as well, Loop-E 1500 will automatically switch to the internal clock source. Loop-E 1500 will automatically switch back to the 2nd clock source when it returns.

When the master clock source returns, the E1500 may or may not return to the master clock source, depending on the master clock source. If the master clock source is LINE or DTE, the E1500 returns to the master clock source one minute after the master clock is recovered. If the master clock source is any other source, the E1500 does not return to the master clock, but instead remains with the 2nd clock source, or free-runs at its internal clock rate if the 2nd clock source is not present. In order to switch back to the master clock source, the clock must be reselected as the master clock source via the front panel MCLK command or the terminal [S] command.

3.2.3 Console Port

The console port allows the user either to use a local VT-100 terminal via modem for system configuration, diagnostics, polling status reports, etc.. The console port must be set to a proper operational mode. If necessary, the user must use the Front Panel to set up the console port to use either a local or a remote terminal. The console port baud, data bit length, stop bit length, parity bit length, XON-XOFF flow control, and interface type set as shown in Table 3-1.

Table 3 - 1 Console Port Default Setting

Item	Options	Default
Baud	38400, 19200, 9600, 2400, 1200	9600
Data Bit	8, 7 bit per byte	8
Stop Bit	2, 1 bit	1
Parity Bit	NONE, EVEN, ODD	NONE
XON-XOFF	ON, OFF	OFF
Interface	TERMINAL, SNMP-SLIP, SNMP-HDLC, SNMP-PPP, SNMP-FR	TERMINAL

NOTE: For optimum operation, LOOP-E & async server should be set to 9600.

3.2.4 Menu Lock

The LCD front panel and terminal are used to read alarms, system configurations, diagnostics, and system status. They also can be used to change system configurations and clear the alarm queue, etc.. By enabling the menu-lock, only read operations are allowed. Modifications to the current status are not allowed. Users may not change system configurations or clear performance data.

- Password and menu-lock options are disabled by default.
- The default terminal access password is “LOOP”.

Menu Lock is coordinated with Password, see next paragraph. When Password is enabled, then menu is also locked.

3.2.5 Logon, Logoff, and Password

Logoff prevents system configuration changes at the terminal, while logon allows system configuration changes. The password feature is used to augment lock control against unauthorized terminal users and front panel users. With password enabled, logon requires entering the correct password. If password is disabled, no password is required to logon and front panel can be used to change system configuration.

- The default option of the password is disabled.

3.2.6 Configuration

User can save the current configurations onto a non-volatile memory. This allows user to retrieve the last stored configuration.

3.3 DS0 Channel Map

DS0 channel multiplexing is done by the DS0-MAP command. A map contains 31 DS0 channels where a single DS0 channel can be assigned to a DTE ports. An idle code is transmitted on all unused channels. Two maps are available to store different DS0 channel assignments: MAP1 and MAP2.

- The default active map is MAP1.
- The default DS0 channel assignment of both MAP1 and MAP2 is idle channel.

When two E1500 units are used in an end-to-end application, there are two ways to configure both units to use the same DS0 channel assignment. One way is to send the current active map from the local E1500 to the remote unit using the SEND command. Another way is to set up the local E1500 to automatically alternate between the two DS0 channel assignments (MAP1 and MAP2). The latter method allows, for example, one channel map to be used during business hours and another map to be used after business hours.

To configure the local E1500 to automatically switch between the two maps, first set the SWITCH time. Next, select SWITCH as the active DS0 map. The current map associated with the SWITCH time is shown at the local E1500 and sent to the remote E1500.

NOTE: For E1 network interface with HDB3 coding or all DTE port with 56KxN bps, all 31 channels are available for DS0 multiplexing configuration.

NOTE: For E1 network interface with AMI coding and DTE port with 64KxN bps, only alternate odd or even DS0 channels should be used. This is required to guarantee one's density requirement.

NOTE: 1. TS16 can be assigned to DTE port.

3.4 E1 Network Line Configuration

A detailed option list of E1 line configuration is in Table 3-2. The following paragraphs will describe each item.

3.4.1 Line Code Format

Loop-E 1500 CSU/DSU can be used in AMI (Alternate Mark Inverting) or HDB3 (High Density Bipolar of order 3) line code format.

3.4.2 CRC Format

Loop-E 1500 CSU/DSU can be used in two frame or multiframe mode. For two frame mode, set CRC (Cycle Redundancy Check) to OFF. For multiframe mode, set CRC to ON. A proprietary facility data link is implemented in both modes to facilitate remote system control and performance and statistics monitoring.

NOTE: CRC must be ON if Facility Data Link (FDL or HDLC) is used.

3.4.3 RAI

Loop-E 1500 CSU/DSU transmits RAI (Remote Alarm Indication) when any of the following is detected: LOS (Loss of Signal), AIS (Alarm Indication Signal), or OOF (Out of Frame) for 2.5 ± 0.5 seconds. User can disable this feature by the Disable RAI (Remote Alarm Indication) command.

3.4.4 Facility Data Link

Loop-E 1500 CSU/DSU utilize proprietary facility data link to facilitate remote system control and performance and statistics monitoring. For Facility Data Link to work, CRC must be ON.

3.4.5 Idle Code

Any DS0 channel, which is not assigned to a DTE port, is an idle channel. An idle code is transmitted on idle DS0 channels. Users may program the idle channel to any bit pattern from 00H to FFH.

NOTE: Due to ones-density requirement, it is advised that idle code to be set as 0xD5. Or, user must program idle code to contain at least two bits of '1'. The factory default idle code is 0xD5.

3.4.6 Frame

Loop-E 1500 CSU/DSU can be used as clear channel when FRAME is set to OFF.

3.4.7 CAS

For E1, CAS (Channel-Associated Signaling) is a method for sending signaling information where time slot 16 of the E1 format is shared for each of 30 other time slots within the same E1. OFF designation is for CAS disabled. For E1, when disabled, the 256N multiframe is used when time slot 16 is available to the user. The maximum number of time slots available for payload is 31. ON designation is for CAS enabled. When enabled, the 256S multiframe is used when time slot 16 is reserved for the transmission for end-to-end signaling using CAS. The maximum number of time slots available for payload is then 30.

3.4.8 E Bit

When E-Bit is set to ON - Enable the use of the E bits in the CRC - 4 multiframe alignment signal for the automatic reporting of a CRC error received during the previous multiframe.

3.4.9 S-Bit Standardization

Loop-E 1500 S-bits usage is standardized for network management and performance monitoring function.

Table 3 - 2 E1 Line Default Setting

Item	Options	Default
Line Code Mode	HDB3, AMI	HDB3
CRC	ON, OFF	ON
RAI	ON, OFF	ON
Facility Data Link	FDL, HDLC, OFF	FDL
Idle Code	0x00 - 0Xff	0xD5
Frame	ON, OFF	ON
S bit	Sa4, Sa5, Sa6, Sa7, Sa8, Sa4+Sa5	Sa4
CAS	ON, OFF	OFF
E bit	ON, OFF	ON

3.5 DTE Configuration

This product is equipped with one DTE port. A detailed option list of DTE configuration is in Table 3-3, and the following paragraph will describe each item.

3.5.1 Rate

DTE port can operate at 56KxN or 64KxN bps, (N is 1 to 31). Use Rate command to select 56K or 64K. Use DS0 MAP command to select number of DS0 channels that the DTE port is going to occupy.

3.5.2 Clock Polarity

Clock polarity of DTE port is either normal or inverted and is used to drive the transmit data and to sample the receive data.

3.5.3 Data Polarity

Data polarity of DTE port is either normal or inverted which is used as positive logic or negative logic.

3.5.4 RTS

DTE facility can use RTS (Request To Send) to control transmission. When RTS is "ACTIVE" and in OFF state, all ones are sent to the E1 line side on the DTE port associated with the DS0 channels. When RTS is "PERMANENT", RTS signal is ignored and forced ON permanently.

3.5.5 TTM

In a normal operating mode, the E1500 uses the transmit clock (from E1500) to sample the transmit data sent from the DTE. In the Terminal Timing Mode (TTM) the E1500 uses the external clock from the DTE to sample the transmit data. This avoids data reception problems due to phase delay caused by long cables. If the DTE cable is too long, the transmit data, after traversing the cable, may not be in-phase with the transmit clock. By using this feature the transmit data will be in phase with the sampling clock, which in this case will be the external clock from the DTE.

Note that the "external clock" from the DTE can also be used as the E1500 system clock. This choice is independent of the TTM option. See the section on Master Clock for the details.

3.5.6 Interface

The DTE port interface type can be either V.35, RS449, RS232, EIA530, and X.21. User must specify the proper interface type when ordering. The user can read the interface type from LCD or terminal.

3.5.7 V.54

Remote channel loopback can be activated and deactivate by V.54 loopback protocol. User can select ITU V.54 or ANSI T1.403.

3.5.8 RL

If RL (Remote Loopback) is set to ON and received remote loopback signal from DTE, the remote unit performs DTE port TO_LINE Loopback by activating V.54 protocol.

3.5.9 LL

If LL (Local Loopback) is set to ON and received local loopback signal from DTE, the local unit performs DTE port TO_DTE Loopback.

Table 3 - 3 DTE Port Default Setting

Item	Options	Default
Rate	56K, 64KxN (N=1 ~ 31)	64KxN
Clock	NORMAL, INVERTED	NORMAL
Data	NORMAL, INVERTED	NORMAL
RTS	ACTIVE, PERMANENT	ACTIVE
TTM	ON, OFF	OFF
V.54	OFF, ANSI, ITU	OFF
RL	OFF, ON	OFF
LL	OFF, ON	OFF

3.6 Router Configuration

The router module supports two interfaces: one is for LAN port and the other is for WAN. Each interface has its own IP address and subnet mask. When the router receives IP packets, it will route these packets to one interface according to its routing algorithm.

3.6.1 IP (LAN or WAN)

The range is between 0.0.0.0 and 255.255.255.255. All 0's and all 1's are not acceptable.

3.6.2 Subnet mask (LAN or WAN)

The range is between 0.0.0.0 and 255.255.255.255. All 0s and all 1s are not acceptable. All the bits with value 1 must be continuous.

3.6.3 Default Gateway

The IP address should be the gateway directly attached to the WAN port. When the router module decides to route packets to the WAN interface, it will apply the IP address to be the destination address.

NOTE 1: The IP address (LAN or WAN) should belong to the subnet divided by the interface's netmask.

NOTE 2: The & bit operation of (LAN IP, LAN Netmask) must be different with the result of the same operation on (WAN IP, WAN Netmask).

3.6.4 B/R Mode (Bridge/ Router Mode)

The router module supports two modes, bridge or router. Router and bridge mode cannot be enable at the same time.

3.7 Alarm and Reports

3.7.1 Alarms

Loop-E 1500 has many types of alarm as listed in Table 3-4. Also, Loop-E 1500 has alarm queue which record the latest 40 alarms with time stamp. Loop-E 1500 also has alarm history and alarm status registers which is used to track the alarm count. Each alarm can be individually enabled or disabled. When disabled, no action is taken. When enabled, alarm counter increments on the occurrence of the specific type of alarm. When alarm occurs or the counter threshold exceeds, alarm is triggered.

Inactivity timeout can be programmed by "S" command. After alarm message is sent, Loop-E 1500 waits for specific number of inactivity timeout second and then disconnect modem. If a new alarm is sent during that period, the timeout counter is reset. Inactivity timeout of 0 second will immediate disconnect modem after alarm message is sent.

Individual fault counts are updated every second. Bipolar Violation (BPV) counts are updated every second, but the BPV alarm is based on an average Bit Error Rate (BER) that is calculated over a 15-minute interval. Therefore, BPV alarm status is updated every 15 minutes after the average BER is calculated. If the average BPV rate exceeds the preset threshold — i.e., from 10^{-9} up to 10^{-5}, an alarm can be declared (assuming BPV alarm is enabled). ES and UAS employ threshold-triggered alarms, but these alarms are declared as soon as the recorded account exceeds the preset threshold. The 15-minute integration interval does not apply to ES and UAS alarms. Alarm register states are reset every 15 minutes, but preserved in the Alarm History display.

Table 3 - 4 Alarm Type Table

ALARM TYPE	ALARM DESCRIPTION	THRESHOLD
"MAST-CLK LOSS"	Master Clock Loss	no
"RAI, LINE"	E1 Line Remote Alarm Indication	no
"AIS, LINE"	E1 Line Alarm Indication Signal	no
"LOS, LINE"	E1 Line Loss of Signal	no
"LOF, LINE"	E1 Line Loss of Frame	no
"BPV, LINE"	E1 Line Bipolar Violation 10E- (5, 6, 7, 8, 9)	yes (default 5)
"ES, LINE"	E1 Line Error Second (1 to 900)	yes (default 1)
"UAS, LINE"	E1 Line Unavailable Second (1 to 900)	yes (default 1)
"CSS, LINE"	E1 Line Control Slip Second (1 to 900)	yes (default 1)
"DTE1 ALARM"	DTE1 RTS loss or clock loss in TTM	no

3.7.2 Report

Loop-E 1500 has three sets of performance and statistics registers. These are line, user, and far-end. The line performance and statistics register tracks the line receiver performance and statistics status. The user performance and statistics register tracks the line receiver as well, but user may clear at any time. The far-end performance and statistics register tracks the far-end Loop-E 1500 receiver status. The performance and statistics parameters are listed in Table 3-5. User performance and statistics register have an additional parameter, CSS (Controlled Slip Second).

Each performance parameter has 96 sets of registers to record 24-hour history in 15-minute intervals.

Table 3 - 5 Performance Parameter List

Performance Parameter	Description	Definition 2-Frame/Multiframe	Definition 16-Frame/Multiframe
ES	Error Second	BPV≥1, OOF≥1, or CS≥1.	CRC ≥ 1, OOF ≥1, or CS ≥1.
BES	Bursty Error Second	1 < BPV < 2048	1 < CRC < 805
SES	Severe Error Second	BPV ≥ 2048, or OOF ≥ 1	CRC ≥ 805, or OOF ≥ 1
DM	Degraded Minute	BPV ≥ 123	CRC ≥ 47
OOF	Out of Frame	1 frame sync loss in 6 consecutive frame bits	1 frame sync loss in 6 consecutive frame bits
LOFC	Loss Of Frame Count	OOF for 2.5 ± 0.5 sec	OOF for 2.5 ± 0.5 sec
UAS	Unavailable Second	≥ 10 consecutive SES	≥ 10 consecutive SES
CSS	Controlled Slip Second	Frame slip ≥ 1	Frame slip ≥ 1

Table 3 - 6 Statistics Parameter List

Statistics Parameter	Description
%AS	Available Second
%EFS	Error Free Second
%ES	Error Second
%BES	Bursty Error Second
%SES	Severe Error Second
%DM	Degraded Minute
%CSS	Controlled Slip Second

Table 3-7 lists the types of reports available, performance parameters provided by each report, and the reset commands for each report.

Table 3 - 7 Performance Report Options

Report Type [Menu Command]	Category	Report						
		ES	UAS	BES	SES	CSS	DM	BPV
Front Panel Reports	USER [Network]	Y	Y	Y	Y	Y	Y	—
1-Hour Terminal Reports Menu Option [1]	USER [Network]	Y	Y	Y	Y	Y	Y	—
	LINE [Network]	N/C	N/C	N/C	N/C	N/C	N/C	—
	FAR-END	N/C	N/C	N/C	N/C	N/C	N/C	—
24-Hour Terminal Reports Menu Option [2]	USER [Network]	Y	Y	Y	Y	Y	Y	Y
	LINE [Network]	N/C	N/C	N/C	N/C	N/C	N/C	N/C
	FAR-END	N/C	N/C	N/C	N/C	N/C	N/C	—

Y = Report available and can be cleared by front panel "RESET" or admin terminal command "Y".
N/C = No clear. Report available, but counts cannot be cleared by the user.
- = Report not available.

3.7.3 Requesting Report

The performance and statistics report can be accessed from local terminal directly or from remote terminal via modem.

Also, performance and statistics report can be accessed via data link. User will set Facility Data Link to FDL or HDLC in order to access remote Loop-E 1500. This enables user to set configuration and monitor performance and statistics of the remote Loop-E 1500.

3.8 LED Operation

The front panel has multicolor LEDs for operation and error indications. The following table lists each LED and its color and indications.

Table 3 - 8 Front-Panel LED Table

LED			Color	Indication
POWER			Green Off	Powered on and operational Power off, self-test failure, or during initialization
LINE	SYNC/TEST		Off Green Flashing Green	E1 line frame not in sync or Los in unframe mode Normal A line-side test is in progress
	LOF		Off Red	Normal or in unframe mode Loss of Frame Sync (LOFS) or Loss of Signal (LOS)
	BPV		Off Red	Normal E1 line has bipolar violation
	RAI/AIS		Off Amber Flashing Amber	Normal or in unframe mode Receive Remote Alarm Indication from E1 line in frame mode Receive AIS from E1 line in frame mode
E1	DTE1, DTE2		Green Flashing Green Red Flashing Red Amber Flashing Amber	SYNC Test LOF/ LOS BPV RAI AIS
DTE	DTE1	TD	Flashing Green	Transmit data present
		RD	Flashing Green	Receive data present
	DTE2	TD	Flashing Green	Transmit data present
		RD	Flashing Green	Receive data present
	DTE1, DTE2		Green Flashing Green Red	Normal Test RTS Loss/ DTE Clock Loss
Router	DTE1	LINK/ ACT	On	Link A valid network connection on the RJ45 Ethernet port
			Flashing	Activity Data is being transmitted or received through the RJ45 Ethernet port
		COL	On	Collision Detected
			Off	No collison
	DTE2	LINK/ ACT	On	Link A valid network connection on the RJ45 Ethernet port
			Flashing	Activity Data is being transmitted or received through the RJ45 Ethernet port
		COL	On	Collision Detected
			Off	No collison
	DTE1, DTE2		Green Flashing Green Red Flashing Red	All WAN up Test One or more WAN down LAN link down

LED			Color	Indication
Bridge	DTE1	LINK/ ACT	On	Link A valid network connection on the RJ45 Ethernet port
			Flashing	Activity Data is being transmitted or received through the RJ45 Ethernet port
		COL	On	Collision Detected
			Off	No collison
	DTE2	LINK/ ACT	On	Link A valid network connection on the RJ45 Ethernet port
			Flashing	Activity Data is being transmitted or received through the RJ45 Ethernet port
		COL	On	Collision Detected
			Off	No collison
	DTE1, DTE2		Green Red	No mapping Mapping
G.703	DTE1, DTE2		Green Flashing Green Red	Normal Test LOS
DTE Empty	DTE1, DTE2		DARK	No plug-in module exists

3.9 Basic Terms

Netmask

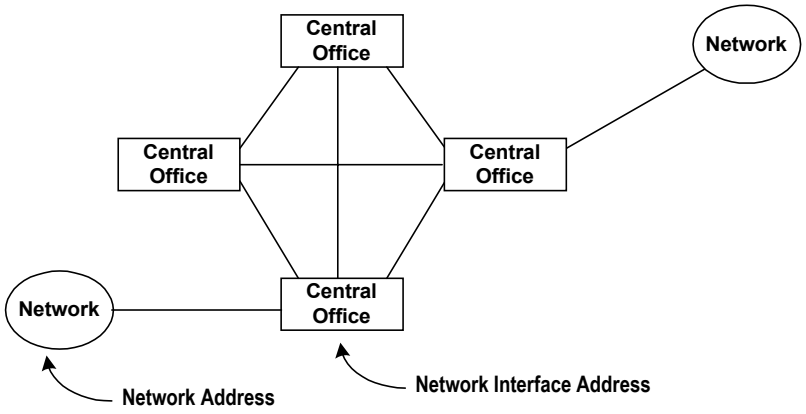
In administering Internet sites, a netmask is a string of 0's and 1's that mask or screen out the network part of an IP address(IP) so that only the host computer part of the address remains. The binary 1's at the beginning of the mask turn the network ID part of the IP address into 0's. The binary 0's that follow allow the host ID to remain. A frequently-used netmask is 255.255.255.0. (255 is the decimal equivalent of a binary string of eight ones.) Used for a Class C subnet (one with up to 255 host computers), the ".0" in the "255.255.255.0" netmask allows the specific host computer address to be visible.

Net Address

Network address, an address of a network equipment on a network. See also below diagram.

NI_Address

Network interface address, an address of a network interface on a network. See also below diagram.



Gateway Address

When referring to a network a gateway is an address used as entry point into another network. For example 166.70.10.1 could be used as a gateway. It is common for .1 and .2 to be setup as a networks gateway. The gateway is commonly the address of a network device such as a network router.

CRC Transparency

Cyclic redundancy check. Error-checking technique in which the frame recipient calculates a remainder by dividing frame contents by a prime binary divisor and compares the calculated remainder to a value stored in the frame by the sending node.

Routing Metric

Method by which a routing algorithm determines that one route is better than another. This information is stored in routing tables. Metrics include bandwidth, communication cost, delay, hop count, load, MTU, path cost, and reliability.

3.10 Error Message

Loop-E 1500 provides various error messages on LCD display to indicate abnormal condition as listed in the following table.

Table 3 - 9 Error Message Table

ERROR CODE	ERROR DESCRIPTION
ERROR01	A loopback is in effect
ERROR02	FDL mode is required
ERROR04	can't be in TTM if MCLK=DTE
ERROR05	DTEn is in TTM or MCLK=DTEn
ERROR06	Can't change active map
ERROR07	No DS0 channel is assigned
ERROR08	Modem error
ERROR09	A diagnostic test is in progress
ERROR10	DTE loopback is in progress
ERROR11	SNMP_SLIP is in progress

3.11 Embedded SNMP Agent (Optional)

The optional embedded SNMP agent for Loop-E 1500 CSU/DSU offers standard RFC 1213 MIB II and RFC 1406 E1 MIB as well as Loop Telecom's enterprise MIB. Although Loop does not endorse any one Network Management product, the following products have been tested. For workstation, HP J6700 HPUX version 11.0 running under SLIP command **"pppd 140.28.1.23:140.28.1.17 slip dedicated / dev/tty0p0 38400 mru 576 netm ask 255.255.255.0 extra-slip-end &"**. For network management system, HP OpenView, SUN workstation, and SNMPc running in PC to monitor and control Loop-E 1500 CSU/DSU. This enables user to integrate WAN equipment management with LAN SNMP network management systems. The embedded SNMP agent also includes Telnet implementation to allow user to access Loop-E 1500 CSU/DSU terminal interface from any workstation in the network.

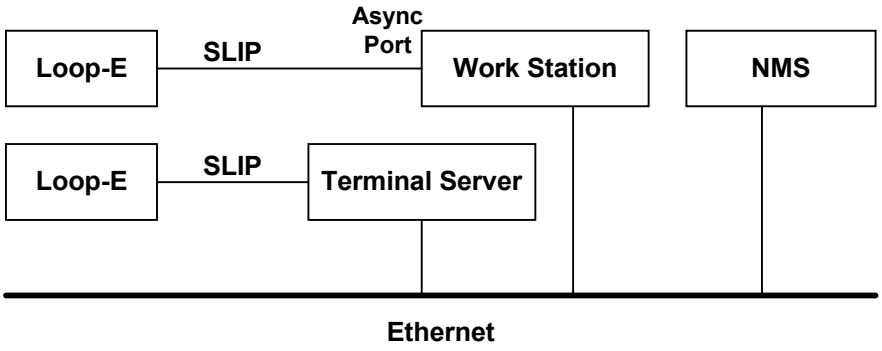


Figure 3- 1 SNMP Connection

The Loop-E 1500 CSU/DSU uses the console port to provide the embedded SNMP agent functionality. If there is only few Loop-E that needs SLIP interface, no dedicated terminal server is needed.

Before SNMP is enabled, make sure the IP address for Loop-E 1500 CSU/DSU is configured correctly and the communication parameters match the Terminal server port.

Once the SNMP agent is activated, user can verify whether the Loop-E 1500 CSU/DSU is running successfully by using *ping* command to check if Loop-E 1500 CSU/DSU is responding or not. e.g.

$ ping 192.1.100.45

192.1.100.45 is alive

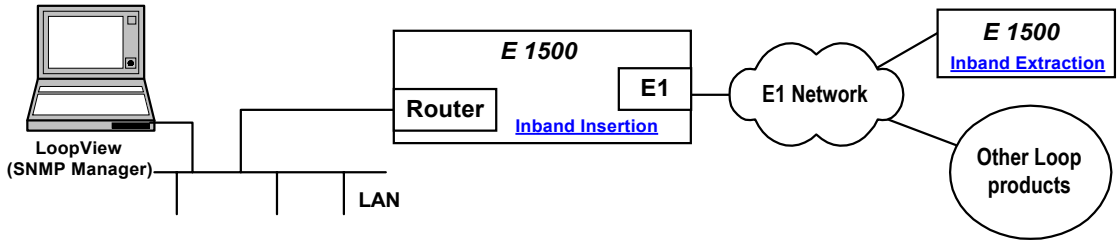
Please refer to each respective SNMP manager operation instruction to incorporate the Loop-E enterprise MIB to the system.

Telnet capability comes with embedded SNMP agent. Once SNMP agent is running, user can use telnet program that is simulated a VT-100 to access Loop-E 1500 CSU/DSU command screen. The most popular Telnet utility in the public domain is provided by NCSA. It can maintains several telnet connections simultaneously. It is recommended to set the console port running at the highest speed to reduce the jittery output on terminal. The Loop-E 1500 CSU/DSU can run reliably at 38.4K bps.

3.12 In-band Management

In addition to the console port and the Ethernet port, E1500 can also allow remote management through a 64 Kbps time slot from the network line. To achieve remote management using this “in-band” technique, two steps are necessary.

First, the Ethernet connection of the remote management terminal must be inserted to a designated time slot in the network. This time slot can be a DS0 channel in a E1 line. This can be achieved though a router-CSU/DSU-mux series of equipment or in one step through a router interface on a E1500.



Next, the equipment to be management, namely this E1500 must extract this 64 Kbps time slot to the management port. This is accomplished through the TSI screen, illustrated below.

For the E1500, the incoming in-band management time slot, which is the first time slot, is assigned to the management channel “m”, as shown.

```
LOOP-E E1 CSU/DSU V1.00     === Local System Setup(MAP) ===      16:40:30 08/30/2002
ARROW KEYS: CURSOR MOVE, TAB: ROLL OPTIONS

DS0-MAP     :ACTIVE MAP = SWITCH  CURRENT MAP = MAP1
             MAP1=[miiiiiiiiii1111111111111111111]
             MAP2=[22222222222222222222222222222]
             SWITCH TIME = MAP1 00:00-12:00       MAP2 12:00-00:00
             (MAP1)DTE1 20:1280K DTE2  0:   0K
             (MAP2)DTE1  0:   0K DTE2 31:1984K









<< Press ESC key to return to previous menu >>
```

4. MAINTENANCE

4.1 Self-Test

At system power up, a complete self-test routine is run to check all I/O ports, read/write memory, and data paths to validate system integrity. During the system self test, "TESTING" message is shown on the upper line of the LCD display. The software release version and date code is shown on the lower line of the LCD display. If an error is found, FAIL is shown in the upper right corner of the LCD display and a dedicated error message is shown on the lower line. Users may press ESC, left arrow (<), right arrow (>), and ″ENTER″ key in this order to read a specific error code. If no error is found, the LCD display will show "PASS" in the upper right corner of the LCD display followed by a Main Menu. Various system diagnostic methodology can be found in the following paragraphs.

4.2 Diagnostics

A 15-bit register PRBS (Pseudo-Random Bit Sequence 2^{15} -1) pattern, is used in Loop-E 1500 CSU/DSU. The PRBS test pattern is used to test local Loop-E 1500 CSU/DSU system integrity by local loopback test. It can also be used to measure the E1 line quality. The diagnostics scenario is as follows:

1. First, send a remote loopback command to cause the remote facility to loopback DS0 channels.
2. Then, activate the local PRBS diagnostics operation, use Test command to enable PRBS and choose tested DS0 channel in a bundle of DTE, all 31 channels, or DTE1, DTE2 channels.
3. The FULL PRBS diagnostic uses a framed pattern. This is useful for testing full E1 loopbacks at the far-end.

   When the PRBS pattern sync is found, a bit error counter tracks total bit errors. It is advised to send PRBS for more than 15 minutes interval to evaluate the quality of loop condition and facility reliability.

In both front panel and terminal operation, user may utilize '>' key to inject single error, '<' key to reset error counter, and 'ESC' key to terminate PRBS test. User may also read performance report to understand the type of error.

4.3 Near End Loopback

The near end loopbacks such as local loopback, line loopback, payload loopback, DTE port loopback, are activated by the local Loop-E 1500. The loopbacks are at the near end facility. The following paragraph describes each loopback in detail.

NOTE: Deactivate the near-end loopbacks from the front panel or the terminal, depending on where it was activated.

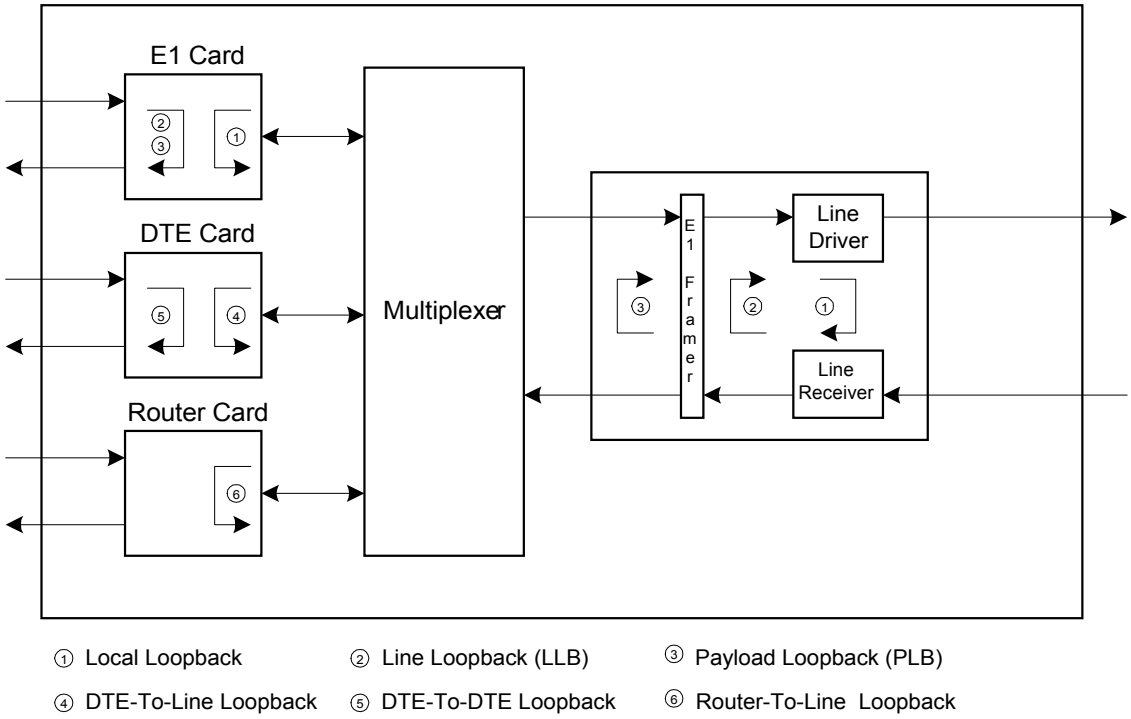


Figure 4- 1 E1 CSU/DSU Loopback Block Diagram

4.3.1 Local Loopback

Local loopback is illustrated in Figure 4-1. The outgoing signal is looped back through the E1 PCM transceiver. All 31 DS0 channels are looped back to the receiver path. This loopback test is activated by the Test command. This loopback test can be used with the PRBS diagnostic test pattern to validate the local Loop-E 1500 CSU/DSU's integrity. The local loopback test can be activated from the front panel and terminal.

4.3.2 Line Loopback

Line loopback is illustrated in Figure 4-1. The incoming E1 line signal is loopback to the outgoing E1 signal before the E1 transceiver framer. This loopback is used to isolate the local equipment from a troubled E1 transmission line. Line loopback test can be activated from the front panel and terminal.

4.3.3 Payload Loopback

Payload loopback is illustrated in Figure 4-1. The incoming signal is loopback to the outgoing E1 signal after the E1 transceiver framer. This loopback is used to isolate the DTE port from the troubled E1 transmission line. Payload loopback test can be activated from the front panel and terminal.

4.3.4 DTE Port Loopback

DTE port loopback is illustrated in Figure 4-1. There are two types of loopback, TO-DTE and TO-LINE. TO-DTE is that the DTE incoming signal is looped back to the DTE outgoing signal. TO-LINE is that the DTE PCM outgoing signal is looped back to the DTE PCM incoming signal. This loopback is used to validate the system integrity of DTE facility. DTE loopback test can be activated from the front panel and terminal.

NOTE: DTE loopbacks work only when one or more DS0 channels are mapped to the DTE port.

4.3.5 Router Loopback

Router card loopback is illustrated in Figure 4-1. TO-LINE loopback is that the router card PCM outgoing signal is looped back to the router card PCM incoming signal. This loopback is used to validate the system integrity of router card. Router card loopback test can be activated from the front panel and terminal.

4.4 Far End Loopback

Far-end loopbacks (remote line loopback, remote payload loopback, remote channel loopback, and V.54 loopback) can be activated by the local E1500 to cause a remote facility to perform the loopbacks. FDL protocols and proprietary codes are utilized to send remote loopback commands to the far-end facility. When using FDL messages, the Line port Facility Data Link must be set to FDL or HDLC. All remote loopback can be activated from the front panel or the terminal.

If the remote facility responds to a remote loopback activate command, a LOOPED message appears in the lower left corner of the display. If the remote facility responds to a remote loopback deactivate command, a NOLOOP message appears. If the remote activation/deactivation fails, an error message appears.

It is best to use remote loopbacks in conjunction with PRBS diagnostics testing to measure the E1 network line integrity. The procedure is as follows:

1. Send a remote loopback command to cause the remote facility to perform a loopback.

2. Activate the PRBS diagnostics test.

NOTE: Deactivate the far-end loopbacks from the front panel or the terminal, depending on where it was activated.

Following are descriptions for each type of far-end loopback.

4.4.1 Remote Line Loopback

The remote line loopback is initiated by the remote equipment through FDL message. Remote line loopback test can be activated from the front panel and terminal.

4.4.2 Remote Payload Loopback

The remote payload loopback is initiated by the remote equipment through Facility data link message. Remote payload loopback test can be activated from the front panel and terminal.

4.4.3 Remote Channel Loopback

The remote channel loopback is initiated by the local equipment through in-band remote channel loopback codes.

In-band activate and deactivate codes are used to enable and disable DTE loopback. This loopback provides an unique way to isolate problems of a specific data path from E1 network line toward remote DTE ports.

4.4.4 V.54 Loopback

Loop-E 1500 CSU/DSU also supports V.54 loopback protocol. See ITU V.54 standards for details. Refer to ANSI T1.403-1995 Annex B.

4.5 Test Pattern

Three test patterns are available to determine faults such as deficient clock recovery, fault ALBO level recovery, inadequate jitter margin, presence of bridge taps, and mis-optioned network interface. These four patterns are described in the following paragraph.

4.5.1 3-in-24 Pattern

This framed 3-in-24 pattern is transmitted within 31 DS0 channels. It tests the consecutive zeros requirement and useful to test AMI circuits.

The 3-in-24 pattern sequence is as follows,

```
(TS0) 01000100 00000000 00000100 01000 . . . . . (Left to Right)
```

(TS0) indicates frame alignment channel.

4.5.2 1-in-8 Pattern

This framed 1-in-8 pattern tests the ability of a circuit to support a pattern having the minimum ones density. It is useful to reveal a timing recovery problem.

Framed 1-in-8 pattern sequence is as follows,

```
(TS0) 01000000 01000000 0100 . . . . . (Left to Right)
```

(TS0) indicates frame alignment channel.

4.5.3 2-in-8 Pattern

This framed 2-in-8 pattern, in conjunction with the 1-in-8 Pattern, is useful when performing tests to reveal the presence of equivalent mis-optioned for HDB3. Use of 2-in-8 pattern will confirm the circuit's ability to support error free transmission when HDB3 substitution do not occur. When use this pattern frame alignment channel's Si (international bit) and Sa4 to Sa8 (FDL data link) must be set to 1. A framed 1-in-8 will cause a HDB3 substitution.

Framed 2-in-8 pattern sequence is as follows,

```
(TS0) 01000100 01000100 01 . . . . (Left to Right)
```

(TS0) indicates frame alignment channel.

4.6 Verifying Loop-E Operations

The purpose of this section is not to help the user determine where a possible fault in the network may lie. For this, the user needs to know the exact geometry of the network. Then standard network trouble shooting procedures should be followed, which involve sectionalizing the network and performing loopback tests on pieces of the network.

The purpose here is to help the user determine whether the Loop-E equipment is at fault after tests have pointed a suspicious finger at this equipment. The procedures outlined here depends on test equipment and other equipment the user may have on hand.

The organization of these procedures start from the simple to the complex. The procedure ends when a definitive conclusion is made that the Loop-E equipment is at fault. To verify that the Loop-E equipment is not at fault, specialized equipment such as a BERT (bit error rate test) set is needed.

4.6.1 Quick Test

See if the LCD display on the Loop-E has normal text. If not, Loop-E has failed.

Remove all line and DTE connections to Loop-E. Remove power. After a few seconds, re-apply power. Observe the power-up self-test sequence. If this fails, then Loop-E has failed.

See if the LEDs show any abnormal displays. If yes, use the LED indications to guide the user to test other parts of the network, such as the E1 line, or DTE equipment.

Especially during initial installation, excessive errors may be due to (a) incorrect configuration of either Loop-E or of the equipment at the other end of the line, or (b) due to faulty line installation, which results in excessive noise, cross talk, or impedance mismatch. Especially in electrically noisy environments, such as central offices, use of shielded cables are mandatory.

4.6.2 Substitution

If a spare Loop-E is available, then replace the working one with the spare. The user must carefully configure the spare exactly as the working one. If the substitution clears the problem, then the original working one is suspect. Note that this is not definitive as other reasons may cause the same symptom. A good practice is to reconfigure the original one and swap once more.

If both units behave the same, then the problem is probably elsewhere.

4.6.3 Using Loopback Plugs

Without a spare, loopback plugs are handy for diagnosis. Note that internal loopback facilities of the Loop-E does not include the interface circuitry. Thus a set of plugs, one for each of the interfaces, line and DTE, are needed for complete tests. These plugs are wired such that signals from the Loop-E are loopback by hard wire back to the receive pin of the same plug.

Replace the line connector with a loopback plug. Observe if the line is in sync. If not then Loop-E has failed. Then perform a PRBS test towards the line. If this fails, then Loop-E has failed.

For the DTE ports, a loopback plug must be used in concert with a far end Loop-E if such a terminal is available, then a PRBS test will determine if that DTE port is at fault.

Note that if a far end terminal is available, the first test should be a local line loopback to see if the line is good.

If the local DTE has diagnostic capabilities, then a loopback plug towards the DTE would help determine if the line to the DTE is good. This can further help isolate the problem.

If tests with loopback plugs all pass, then the problem is probably elsewhere.

4.6.4 Using Bert Test Set

If a BERT (bit error rate test) set is a available, such as the Fireberd 6000, then a comprehensive suite of test are available to examine the health of the Loop-E.

With a BERT, each of the ports of the Loop-E can be tested individually. The user must configure the BERT in the exact way the Loop-E is configured. This is easily done by comparing each of the options one by one. After checking that the configuration matches, if any one of the ports fails, then Loop-E has failed.

5. FRONT PANEL OPERATION

The front panel operation utilizes a two by sixteen (2 x 16) characters LCD display window and four keypads each labeled with ESC, ENTER, left arrow '<', and right arrow '>', as shown in Figure 5-1.

ENTER key is used to move down the menu tree or to enable a selection.

LEFT and **RIGHT Arrow** keys show other menu item in the same level.

ESC key returns the operation to an upper layer menu up to the main menu.

NOTE: The ENTER key must be used to confirm a change. Where YES is shown at the lower right corner, it must be selected to enable a change.

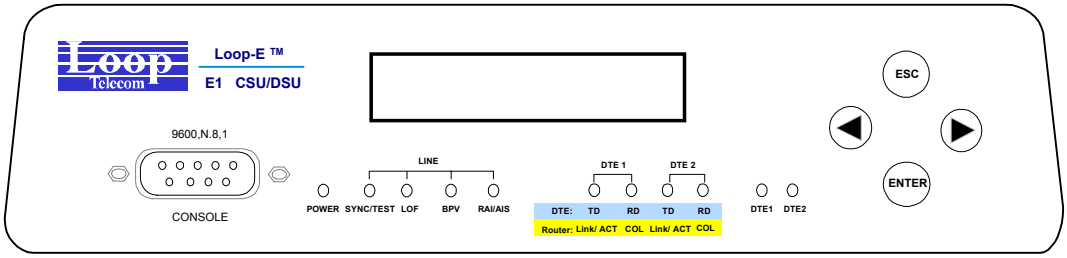


Figure 5- 1 Loop-E Front Panel

Each display only shows one menu item. The main menu is shown in Figure 5-2. It is the first menu displayed after power up.

```
LOOP-E 1500-2S
Configuration
```

The first tier menu includes Configuration, Diagnostics, Alarm, Performances, and Miscellaneous. Each sub-menu is further broken down into sub-level menus. Subsequent chapters give detailed information regarding these menus.

To change selection, use left and right arrow key to a proper selection and then press the ENTER key.

NOTE: The current selected items are highlighted by an asterisk (*).

NOTE: For Compatibility with other Loop product families where more than one DTE ports are available, the DTE port for this Loop-E 1500 CSU/DSU will be referred to as DTE-1.

5.1 Configuration Menu

Configuration group includes DS0-Map, Line, DTE1, DTE2, Master Clock, Save Config, Restore Config, Console Port, Date, and Time Menu.

```
LOOP-E 1500-2S
Configuration
```

5.1.1 DS0-Map Menu

DS0-Map menus are used to configure DS0 channel assignment for DTE port. It is also used to program MAP1 and MAP2 schedule as well as to enable SWITCH function. DS0 channel assignment can be sent to the remote end by SEND command. Under configuration menu, use left or right key to select DS0-Map menu.

```
Configuration
DS0-Map
```

5.1.1.1 Active Map Menu

To change the MAP simply use left or right arrow key cycle through to a proper MAP or SWITCH and press ENTER. While the SWITCH is selected, the current active map is shown inside the bracket.

```
DS0-Map
 Active Map
```

5.1.1.2 Map1 Menu/ MAP 2 Menu

Map1 menu is used to change the port assignment for each DS0 channel. To change a specific DS0 channel port assignment, press ENTER form Map1 menu. There are four options are available for Ch-1 menu: DTE1, DTE2, Inband, and Idle. For example, to change Channel-1 port assignment :

```
DS0-Map
 Map1
```

```
Map1
Ch-1
```

use left or right arrow key cycle through to a proper designated port and press the ENTER key to select. The current selection will be highlighted by an asterisk (*).

```
Ch-1  2:128K
*DTE2
```

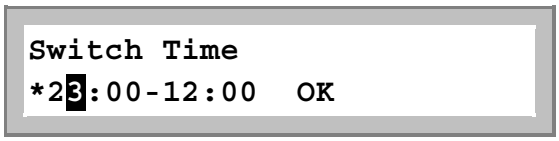
As the above example indicates, channel-1 is assigned to DTE2 port, right top corner 2:128K indicates there are two DS0 channels assigned to DTE2 port and corresponds to 128 Kbps of total 1984 Kbps bandwidth currently.

NOTE: Map2 Menu operation is similar.

```
DS0-Map
 Map2
```

5.1.1.3 Switch Time Menu

Switch Time menu shows the current MAP1 and MAP2 schedule as the following display. In this case, MAP1 is scheduled START from 23:00 and END at 12:00 and MAP2 is scheduled START from 12:00 and END at 23:00. To change MAP1 and MAP 2 schedule, use left or right arrow key to the digital position, and press ENTER key to cycle through the time number. This operation must be concluded by moving left or right arrow key to OK position and press ENTER to enable the changes.



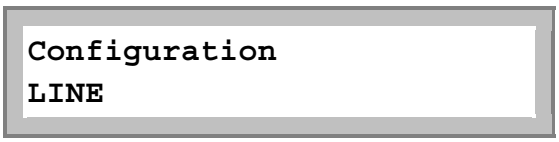
5.1.1.4 Send Map Menu

Under Send Map menu and press ENTER to

At this menu, press ENTER will send the current working DS0 map information to the far end. It will overwrite the current far end working DS0 map. Otherwise press ESC to exit without any action. This Send Map menu uses proprietary FDL data link message, and is only available when FDL is set to FDL or HDLC. Otherwise, error message display. If far end facility acknowledges this command, an ACK is shown on the LCD display. Otherwise, a FAIL message is shown on the LCD display.

5.1.2 Line Menu

Line menu includes: line code, CRC, RAI, FDL, idle code, frame, S-bit, E-bit, and CAS. Line menus are used to configure E1 line operation mode such as line code, CRC, RAI transmission when LOF and LOS, FDL data link transmission, and transmission idle code. Under configuration menu, use left or right key to select Line menu.



5.1.2.1 Code Format Menu

Press ENTER from the Line Code menu.

Two options of line code are available: HDB3 and AMI.

To select the coding scheme, use left and right arrow key cycle through to a proper selection and press ENTER.

5.1.2.2 CRC Code Menu

Press ENTER from Line CRC menu.

To change the CRC to ON or OFF, use left and right arrow key to cycle through to a proper selection and press ENTER. CRC must be ON if FDL is FDL or HDLC.

5.1.2.3 RAI Menu

Press ENTER from Line RAI menu.

RAI (remote alarm indicator) menu shows the current RAI transmission state when Loop-E loss of signal and loss of frame alignment. To enable RAI being automatically send out when loss of signal and loss of frame sync, use left and right arrow key to cycle through to ON and press ENTER. To disable RAI sending, use left and right arrow key cycle through to OFF and press ENTER.

5.1.2.4 FDL Menu

Press ENTER from Line FDL menu.

```
LINE
FDL
```

```
Line FDL
*FDL
```

FDL menu shows the FDL data link state. To enable or disable, use left and right arrow key to cycle through to FDL, HDLC or OFF and press ENTER. For FDL to work, CRC must be ON also.

5.1.2.5 Idle Code Menu

Press ENTER from Line Idle Code menu.

```
LINE
Line Idle Code
```

```
Line Idle Code
*0xd5        OK
```

Idle menu shows the transmission idle code when DS0 channel is in idle mode. To change idle code, press ENTER key to cycle through the idle code. This operation must be concluded by moving left or right arrow key to OK position and press ENTER to enable the changes.

NOTE: Due to one's density requirement, it is advised that idle code to be set as 0xd5. Also, user must program idle code to contain at least two bits of 1. The factory default idle code is 0xd5.

5.1.2.6 Frame Menu

Press ENTER from Line Frame menu.

```
LINE
Line Frame
```

```
Line Frame
*ON
```

Frame menu shows the E1 frame mode. To enable or disable, use left and right arrow key to cycle through to ON or OFF and press ENTER. When OFF is selected, Loop-E is used as clear channel.

5.1.2.7 S-Bit Menu

Press ENTER from Line S-bit menu. S-bit menu shows the s-bit type. The current selection is highlighted by an asterisk "*". To select the S-bit, move cursor to a proper selection and hit ENTER.

```
LINE
Line S-bit
```

Six options of line S-bit are available: Sa4, Sa5, Sa6, Sa7, Sa8, and Sa4+Sa5.

```
Line S-bit
*Sa4
```

```
Line S-bit
 Sa5
```

```
Line S-bit
 Sa6
```

```
Line S-bit
 Sa7
```

```
Line S-bit
 Sa8
```

```
Line S-bit
 Sa4+Sa5
```

5.1.2.8 E-Bit Menu

Press ENTER from Line E-bit menu. E-bit menu shows the E-bit type. The current selection is highlighted by an asterisk "*".

Press ENTER from the above menu, then move cursor to select ON or OFF to enable or disable it.

5.1.2.9 CAS Menu

Press ENTER from CAS menu. The current selection is highlighted by an asterisk "*".

Press ENTER from the above menu, then move cursor to select ON or OFF to enable or disable it.

5.1.3 DTE1 Menu

DTE1 menu is used to setup system of the module in DTE1. For the following example, DTE1 is plug-ined with V.35 interface. So the sub-menu for DTE1 includes: Rate, Clock, Data, Inteface, RTS, TTM, V54, RL (Remote Loopback), and LL (Local Loopback).

```
Configuration
DTE1
```

5.1.3.1 Rate

Rate menu is used to seting line rate.

```
DTE1(DTE)
Rate
```

Two options are available: 64KxN and 56KxN. The current selection will be highlighted by an asterisk (*).

```
DTE1(DTE) Rate
*64KxN
```

```
DTE1(DTE) Rate
 56KxN
```

5.1.3.2 Clock

This menu is used to set DTE1 clock as normal or inverted.

```
PORT-1
Clock
```

Use arrow keys to select the desired seleciton, press ENTER. The current selection will be highlighted by an asterisk (*).

```
DTE1(DTE) Clock
*NORMAL
```

```
DTE1(DTE) Clock
 INVERTED
```

5.1.3.3 Data

This menu is used to set DTE1 data as normal or inverted.

```
DTE1(DTE)
Data
```

Use arrow keys to select the desired seleciton, press ENTER. The current selection will be highlighted by an asterisk (*).

```
DTE1(DTE) Data
*NORMAL
```

```
DTE1(DTE) Data
 INVERTED
```

5.1.3.4 Interface

This menu is used to display the type of current DTE interface in DTE1.

```
DTE1(DTE)
Interface
```

```
DTE1(DTE) Interface
*V.35
```

5.1.3.5 RTS

The RTS menu shows the current DTE RTS operation mode, active or permanent.

```
DTE1(DTE)
RTS
```

Use arrow keys to select the desired seleciton, press ENTER. The current selection will be highlighted by an asterisk (*).

```
DTE1(DTE) RTS
*ACTIVE
```

```
DTE1(DTE) RTS
 PERMANENT
```

5.1.3.6 TTM

TTM menu shows the current DTE terminal timing mode, off or on, by placing an asterisk (*) with the appropriate selection.

```
DTE1(DTE)
TTM
```

Use arrow keys to select the desired seleciton, press ENTER. The current selection will be highlighted by an asterisk (*).

```
DTE1(DTE) TTM
*OFF
```

```
DTE1(DTE) TTM
 ON
```

5.1.3.7 V54

This menu is used to control remote V54 channel loopback tests.

```
DTE1(DTE)
V54
```

Use arrow keys to select the desired seleciton, ANSI or OFF, press ENTER. The current selection will be highlighted by an asterisk (*).

```
DTE1(DTE) V54
*ANSI
```

```
DTE1(DTE) V54
 OFF
```

5.1.3.8 RL

This menu is used to enable or disable the remote loopback.

```
DTE1(DTE)
RL
```

Use arrow keys to select the desired seleciton, press ENTER. The current selection will be highlighted by an asterisk (*).

```
DTE1(DTE) RL
*ON
```

```
DTE1(DTE) RL
 OFF
```

5.1.3.9 LL

This menu is used to enable or disable the local loopback.

```
DTE1(DTE)
LL
```

Use arrow keys to select the desired seleciton, press ENTER. The current selection will be highlighted by an asterisk (*).

```
DTE1(DTE) LL
*ON
```

```
DTE1(DTE) LL
 OFF
```

5.1.4 DTE2 Menu

DTE2 menu is used to setup system of the module in the second slot. For the following example, DTE2 is plug-ined with E1 interface. So the sub-menu for DTE2 includes: Code, CRC, RAI, FDL, Idle Code, FRAME, S-Bit, E-bit, and CAS.

5.1.4.1 Code

```
DTE2(E1)
Code
```

To select the coding scheme, use left and right arrow key cycle through to a proper selection and press ENTER.

```
DTE2(E1) Code
*HDB3
```

```
DTE2(E1) Code
 AMI
```

5.1.4.2 CRC

```
DTE2(E1)
CRC
```

To change the CRC to ON or OFF, use left and right arrow key to cycle through to a proper selection and press ENTER. CRC must be ON if FDL is FDL or HDLC.

```
DTE2(E1) CRC
*ON
```

```
DTE2(E1) CRC
 OFF
```

5.1.4.3 RAI

```
DTE2(E1)
RAI
```

RAI (remote alarm indicator) menu shows the current RAI transmission state when Loop-E loss of signal and loss of frame alignment. To enable RAI being automatically send out when loss of signal and loss of frame

sync, use left and right arrow key to cycle through to ON and press ENTER. To disable RAI sending, use left and right arrow key cycle through to OFF and press ENTER.

```
DTE2(E1) RAI
*ON
```

```
DTE2(E1) RAI
 OFF
```

5.1.4.4 Idle Code

```
DTE2(E1)
Idle Code
```

Idle menu shows the transmission idle code when DS0 channel is in idle mode. To change idle code, press ENTER key to cycle through the idle code. This operation must be concluded by moving left or right arrow key to OK position and press ENTER to enable the changes.

```
DTE2(E1) Idle Code
*0Xd5          OK
```

NOTE: Due to one's density requirement, it is advised that idle code to be set as 0xD5. Also, user must program idle code to contain at least two bits of 1. The factory default idle code is 0xD5.

5.1.4.5 Frame

```
DTE2(E1)
FRAME
```

Frame menu shows the E1 frame mode. To enable or disable, use left and right arrow key to cycle through to ON or OFF and press ENTER. When OFF is selected, Loop-E is used as clear channel.

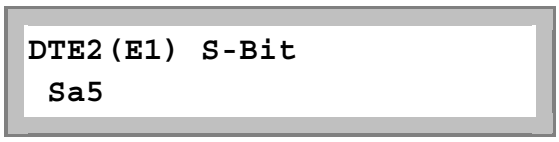
```
DTE2(E1) FRAME
*ON
```

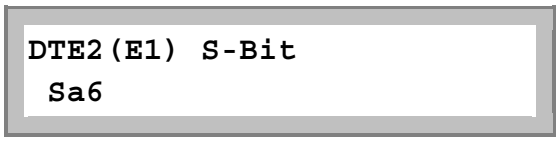
```
DTE2(E1) FRAME
 OFF
```

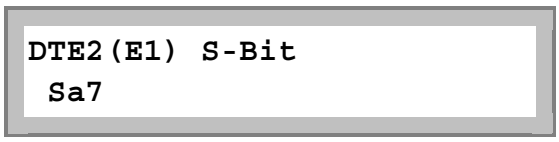
5.1.4.6 S-Bit

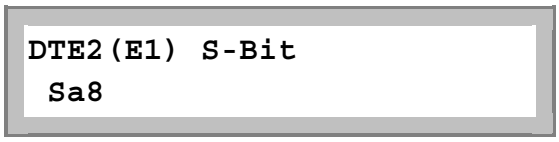
S-bit menu shows the s-bit type. The current selection is highlighted by an asterisk "*". To select the S-bit, move cursor to a proper selection and hit ENTER.

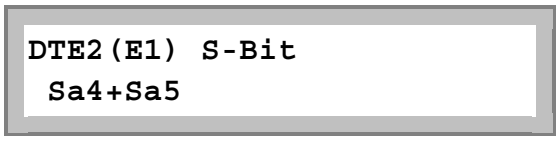
Six options of line S-bit are available: Sa4, Sa5, Sa6, Sa7, Sa8, and Sa4+Sa5.











5.1.4.7 E-bit

```
DTE2(E1)
E-bit
```

To change the E-Bit to ON or OFF, use left and right arrow keys to cycle through to a proper selection and press ENTER.

```
DTE2(E1) E-bit
*ON
```

```
DTE2(E1) E-bit
 OFF
```

5.1.4.8 CAS

```
DTE2(E1)
CAS
```

To change the CAS to ON or OFF, use left and right arrow keys to cycle through to a proper selection and press ENTER.

```
DTE2(E1) CAS
*ON
```

```
DTE2(E1) CAS
 OFF
```

5.1.5 Master Clock Menu

Master clock menus are used to configure the master clock source and clock rate. Under Configuration menu, use left or right key to select Master Clock menu.

```
Configuration
Master Clock
```

5.1.5.1 Master Clock Menu/ Secondary Clock Menu

(**NOTE**: Secondary Clock Menu operation is similar.)

Master clock menus are used to configure the master clock source and clock rate.

```
Master Clock
Primary-Clk
```

Press ENTER from Master Clock Primary Clock menu. To change the clock source to INTERNAL, DTE-1, DTE-2, and LINE, use left and right arrow key to cycle through to a proper selection and press ENTER.

```
Primary-Clk
*INTERNAL
```

```
Primary-Clk
 DTE-1
```

If co-directional interface is plugged into main unit, the LCD menu will show as below.

```
Primary-Clk
 DTE1(G.703)
```

```
Primary-Clk
 DTE-2
```

```
Primary-Clk
 LINE
```

5.1.5.2 Current Active-Clock Menu

Current Active clock menu shows the current active clock source is PRI-CLK master clock or 2nd master clock.

```
Master Clock
Current:PRI-CLK
```

5.1.6 Save System Configuration Menu

Save system configuration menu is used to store system configuration. Under Configuration menu, use left or right key to select Save Config menu.

Press ENTER from Configuration Save Config menu.

```
Save Config
Confirm ?
```

At this menu, press ENTER will store the current working configuration onto user stored configuration. A WAIT...OK" is shown on the LCD display. Otherwise press ESC to exit without any action.

5.1.7 Restore System Configuration Menu

Restore system configuration menu is used to retrieve system configuration. Under Configuration menu, use left or right key to select Restore Config menu.

Press ENTER from Configuration Restore Config menu.

```
Restore Config
Confirm ?
```

At this menu, press ENTER will retrieve the user stored configuration to the current working configuration. A WAIT...OK" is shown on the LCD display. Otherwise press ESC to exit without any action.

NOTE: When the user stored configuration is retrieved, all loopback tests will be terminated, and all alarm queue and alarm history are reset. The current working configuration will be overwritten.

5.1.8 Console Port Menu

The menus are used to configure console port to select data rate, data bits, stop bits, parity bit, XON-XOFF control, interface type, and SNMP control as the following paragraph. Under Configuration menu, use left or right key to select Console Port menu.

```
Configuration
Console Port
```

NOTE: The front panel must be used to set up the Console port interface type.

5.1.8.1 Baud Rate Menu

Press ENTER from Console Port Baud Rate menu.

There are six options of Baud rate are available: 1200, 2400, 4800, 9600, 19200, and 38400. To change data speed, use left and right arrow key to cycle through to a desired selection and press ENTER. The current selection will be highlighted by an asterisk (*).

5.1.8.2 Data Length Menu

Press ENTER from Console Port Data Length menu.

To change data bits, use left and right arrow key to cycle through to a desired selection and press ENTER.

5.1.8.3 Stop Bit Menu

Press ENTER from Console Port Stop Bit menu.

To change stop bits, use left and right arrow key to cycle through to a desired selection and press ENTER.

5.1.8.4 Parity Menu

Press ENTER from Console Port Parity menu.

```
Console Port
Parity
```

To change data parity, use left and right arrow key to cycle through to a desired selection and press ENTER.

```
Parity
*NONE
```

```
Parity
 EVEN
```

```
Parity
 ODD
```

NOTE: User MUST use front panel to set up console port configuration properly in order to use terminal and modem mode.

5.1.8.5 Xon-Xoff Menu

Press ENTER from Console Port Xon-Xoff menu.

```
Console Port
Xon-Xoff
```

To change, use left and right arrow key to cycle through to a desired selection and press ENTER.

```
Xon-Xoff
*OFF
```

```
Xon-Xoff
 ON
```

NOTE: Xon-Xoff flow control will be terminated when SNMP mode is selected

5.1.8.6 Interface Menu

Press ENTER from Console Port Interface menu.

```
Console Port
Interface
```

To change the console port interface type to TERMINAL, SNMP-HDLC, SNMP-SLIP, SNMP-FR, or SNMP-PPP, use left and right arrow key to cycle through to a desired selection and press ENTER. In modem mode, a modem initialization routine is run to establish the connection. The initialization routine must be run each time the modem is installed. SNMP-SLIP item is only available when SNMP feature is purchased. This is an optional feature. When SNMP-SLIP is selected, communication port must connect to a Terminal Server for operation.

```
Interface
*TERMINAL
```

```
Interface
 SNMP-HDLC
```

```
Interface
 SNMP-SLIP
```

```
Interface
 SNMP-FR
```

```
Interface
 SNMP-PPP
```

NOTE: For optimum operation, LOOP-E & async server should be set to 9600.

5.1.8.7 My IP Address Menu

Press ENTER from Console Port My IP menu. My IP Address menu shows the current IP address of Loop-E. To change IP address, use left or right arrow key to select the position, and press ENTER key to cycle through the number. This operation must be concluded by moving left or right arrow key to OK position and press ENTER to enable the changes.

```
Console Port
My IP
```

```
My IP         OK
*140.132.009.101
```

5.1.8.8 Trap IP Menu

Trap IP Address menu shows the current destination IP address of Loop-E used to send an SNMP trap. The default Trap IP address is broadcast address (255.255.255.255). To change Trap IP address, use left or right arrow key to cycle through to the position, and press ENTER key to cycle through the number. This operation must be concluded by moving left or right arrow key to OK position and press ENTER to enable the changes.

```
Console Port
Trap IP
```

```
My IP         OK
*255.255.255.255
```

5.1.8.9 Subnet Mask Menu

This menu is used to setting subnet number. To change address of subnet mask, use left or right arrow key to cycle through to the position, and press ENTER key to cycle through the number. This operation must be concluded by moving left or right arrow key to OK position and press ENTER to enable the changes.

```
Console Port
Subnet Mask
```

```
Subnet Mask   OK
*000.000.000.000
```

5.1.8.10 Gateway IP Menu

This menu is used to setting gateway IP address. To change address of gateway, use left or right arrow key to cycle through to the position, and press ENTER key to cycle through the number. This operation must be concluded by moving left or right arrow key to OK position and press ENTER to enable the changes.

```
Console Port
Gateway IP
```

```
Gateway IP    OK
*000.000.000.000
```

5.1.8.11 Frame Relay Menu

Press ENTER from Console Port Frame Relay menu. Use arrow keys to select a desired item, press ENTER to the submenu of each item.

```
Console Port
Frame Relay
```

DLCI: Data Link Connection Identifier

Value that specifies a PVC or an SVC in a Frame Relay network. In the basic Frame Relay specification, DLCIs are locally significant (connected devices might use different values to specify the same connection).

```
Frame Relay
DLCI
```

```
DLCI
*100 (16-991) OK
```

LMI: Local Management Interface.

Set of enhancements to the basic Frame Relay specification. LMI includes support for a keepalive mechanism, which verifies that data is flowing; a multicast mechanism, which provides the network server with its local DLCI and the multicast DLCI; global addressing, which gives DLCIs global rather than local significance in Frame Relay networks; and a status mechanism, which provides an on-going status report on the DLCIs known to the switch.

Two options, ANSI and ITU, are available for LMI. Use arrow keys to select a desirec option, press ENTER. The current selection will be highlighted by asterisk (*).

```
Frame Relay
LMI
```

```
LMI
*ANSI
```

```
LMI
 ITU
```

CIR: committed information rate.

The rate at which a Frame Relay network agrees to transfer information under normal conditions, averaged over a minimum increment of time. CIR, measured in bits per second, is one of the key negotiated tariff metrics.

```
Frame Relay
CIR
```

```
CIR
*64    (0-64)    OK
```

Bc: committed burst.

Negotiated tariff metric in Frame Relay internetworks. The maximum amount of data (in bits) that a Frame Relay internetwork is committed to accept and transmit at the CIR.

```
Frame Relay
Bc
```

```
Bc
*64    (0-64)    OK
```

Be: excess burst.

Negotiated tariff metric in Frame Relay internetworks. The number of bits that a Frame Relay internetwork attempts to transmit after Bc is accommodated. Be data, in general, is delivered with a lower probability than Bc data because Be data can be marked as DE by the network.

```
Frame Relay
Be
```

```
Be
*64    (0-64)    OK
```

T391:

Timer indicates how often the platform sends status inquiries to the frame relay network.

```
Frame Relay
T391
```

```
T391
*10    (5-30)    OK
```

N391:

Counter indicates how often the platform should send a Full Status inquiry to the frame relay network. A full status inquiry updates the status of PVCs coming from the service.

```
Frame Relay
N391
```

```
N391
*006    (1-255)    OK
```

N392:

Counter indicates number of errors needed in last N3 to declare the link down.

```
Frame Relay
N392
```

```
N392
*3    (1-9)    OK
```

N393:

Counter indicates number of consecutive correct timing needed to reset link.

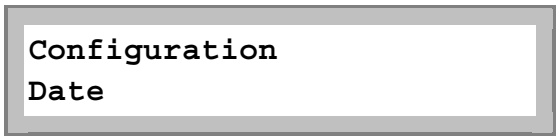
```
Frame Relay
N393
```

```
N391
*4    (1-9)    OK
```

5.1.9 Date Menu

Date menu is used to reset new RTC date. Under Configuration menu, use left or right key to select Date menu.

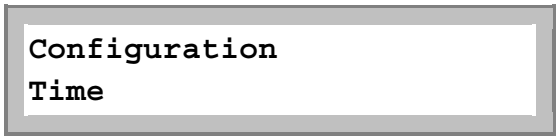
Press ENTER from Configuration Date menu.



To change date, use left or right arrow key to move to the digital position, and press ENTER key to cycle through the number. This operation must be concluded by moving left or right arrow key to OK position and press ENTER to enable the changes.

5.1.10 Time Menu

Time menu is used to set new system time. Under Configuration menu, use left or right key to select Time menu.



Press ENTER from Configuration Time menu.

To change time, use left or right arrow key to move to the digital position, and press ENTER key to cycle through the number. This operation must be concluded by moving left or right arrow key to OK position and press ENTER to enable the changes.

5.2 Diagnostics Menu

Diagnostics group includes Near Loopback, DTE1 Loopback, DTE2 Loopback, Remote Loopback, Remote DTE Loopback, Remote V54 Loopback, andTesting Pattern Menus.

NOTE: As daughter card is Bridge interface, the Diagnostics group only provides Near Loopback.

```
Loop-E 1500-2S
Diagnostics
```

5.2.1 Near Loopback Menu

Near Loopback menus are used to control near end E1 line side loopback operation such as local loopback test, payload loopback test, and line loopback test. Under Diagnostics menu, use left or right key to select Near Loopback menu.

Press ENTER from Diagnostics Near Loopback menu.

```
Diagnostics
Near Loopback
```

Select OFF to end the loopback test.

```
Near Loopback
*OFF
```

```
Near Loopback
 LOCAL
```

```
Near Loopback
 PAYLOAD
```

```
Near Loopback
 LINE
```

5.2.2 DTE1 Loopback Menu/ DTE2 Loopback Menu

DTE1 Loopback is used to perform DTE1 loopback test, Line Loopback test (LLB), and Payload Loopback test (PLB). Under Diagnostics menu, use left or right key to select DTE Loopback menu.

Press ENTER from Diagnostics Card Loopback menu.

```
Diagnostics
DTE1(DTE) Loopback
```

To select a loopback type, use left or right arrow key to cycle through to a desired selection and press ENTER. LOCAL to start local loopback test, PAYLOAD to start payload loopback test, and LINE to start line loopback test. Select OFF to end the loopback test.

```
DTE1(DTE) Loopback
*OFF
```

```
DTE1(DTE) Loopback
 TO-DTE
```

```
DTE1(DTE) Loopback
 TO-LINE
```

5.2.3 G.703 Loopback

DTE1 Loopback is used to perform DTE1 loopback test, Line Loopback test (LLB), and Payload Loopback test (PLB). Under Diagnostics menu, use left or right key to select DTE Loopback menu.

The following LCD menus are for co-directional interface.

Press ENTER from Diagnostics Card Loopback menu.

```
Diagnostics
DTE1(G.703) LB
```

To select a loopback type, use left or right arrow key to cycle through to a desired selection and press ENTER. LOCAL to start local loopback test, PAYLOAD to start payload loopback test, and LINE to start line loopback test. Select OFF to end the loopback test.

```
DTE1(G.703) LB
*OFF
```

```
DTE1(G.703) LB
 TO-DTE
```

```
DTE1(G.703) LB
 TO-LINE
```

5.2.4 Remote Loopback Menu

Remote Loopback is used to activate E1 line remote loopback test.

```
Diagnostics
Remote Loopback
```

Press ENTER from Diagnostics Remote Loopback menu. To activate or deactivate remote E1 line loopback, use left or right arrow key cycle through to a desired selection and press ENTER: PLB for remote payload loopback, and LINE for remote line loopback.

```
Remote Loopback
*ACTIVATE PLB
```

```
Remote Loopback
 ACTIVATE LINE
```

```
Remote Loopback
 DEACT PAYLOAD
```

```
Remote Loopback
 DEACT LINE
```

5.2.5 RemDTE Loopback Menu

Remote Loopback is used to activate E1 line remote loopback test.

```
Diagnostics
RemDTE Loopback
```

Press ENTER from Diagnostics Remote Loopback menu.To activate or deactivate all loopbacks and DTE-1 loopback, use left or right arrow key cycle through to a desired selection and press ENTER:

```
RemDTE Loopback
*ACTIVATE ALL
```

```
RemDTE Loopback
 ACTIVATE DTE-1
```

```
RemDTE Loopback
 DEACT ALL
```

```
RemDTE Loopback
 DEACT DTE-1
```

5.2.6 RemV54 Loopback

This menu is used to control remote V54 channel loopback.

```
Diagnostics
RemV54 Loopback
```

To activate or deactivate DTE-1 loopback, use left or right arrow key cycle through to a desired selection and press ENTER:

```
RemV54 Loopback
*ACTIVATE DTE-1
```

```
RemV54 Loopback
 DEACT DTE-1
```

5.2.7 Testing Pattern Menu

Testing Pattern menu is used to perform PRBS diagnostics or select a variety of test pattern. Under Diagnostics menu, use left or right key to select Testing Pattern menu.

```
Diagnostics
Testing Pattern
```

Press ENTER from Diagnostics Testing Pattern menu. Use left or right arrow key cycle through to a desired test pattern, and press ENTER.

```
Testing Pattern
*TESTING OFF
```

```
Testing Pattern
 PRBS FULL
```

```
Testing Pattern
 PRBS DTE-1
```

PRBS is used to perform PRBS (Pseudo-Random Bit Sequence 2^{15} -1) test. PRBS test channel is selected by FULL (all 31 DS0 channels). When PRBS is activated, the LCD display shows the results of pattern synchronization, test DTE channel, and errors count. If PRBS pattern is received, PRBS SYNC is shown on the LCD display. Else, PRBS UNSYNC is shown and bit error count is displayed which counts all single error.

User may use > key to inject single bit error, < key to reset error counter, and ESC key to quit PRBS test.

```
Testing Pattern
*PRBS FULL
```

```
PRBS FULL            SYNC
BIT ERROR= 0
```

In above example, PRBS test status shows the result of the test continuously with the test channel FULL, pattern synchronization SYNC, the bit error count BIT ERROR= 0".

The test pattern is used to transmit on all 31 channels to the E1 line. Four test patterns such as 3-IN-24, 1-IN-8, and 2-IN-8 are available. To terminate pattern transmit, press ESC key.

```
TRANSMITTING...
3-IN-24 PATTERN
```

5.2.8 Loopback Timer Menu

Loopback Timer menu is used to setup loopback time. Under Diagnostics menu, use left or right key to select Loopback Timer menu.

```
Diagnostics
Loopback Timer
```

Press ENTER from Loopback Timer menu. Use left or right arrow key at a desired position, then press ENTER to select a desired number. After done the setting, move the cursor to OK, then press ENTER to confirm it.

```
Loopback Timer
*00000000(sec)       OK
```

5.3 Alarm Menu

Alarm group includes Alarm Queue, Alarm History, Alarm Clear, Alarm Setup, and Alarm Cut-off menus. Alarm menu is used to view alarm queue and alarm history, to clear alarm queue, and alarm history, as well as setup alarm threshold, etc. as in the following paragraph.

```
Loop-E 1500-2S
Alarm
```

5.3.1 Alarm Queue Menu

Alarm Queue menu is used to view alarm queue. Under Alarm menu, use left or right key to select Alarm Queue menu.

```
Alarm
Alarm Queue
```

Press ENTER from Alarm Queue menu.

```
1:"LOS,LINE"
08:28:46 01/01/97
```

Alarm Queue menu shows the alarm queue of last 10 alarms. To view any one of the ten alarm queue, use left or right arrow key cycle through and the alarm status is shown on. In the above example, "LOS, LINE" , first part shows alarm type is LOS (Loss Of Signal), second part shows where the alarm occurs is LINE port. It also shows time and date when the alarm took place.

5.3.2 Alarm History Menu

Alarm History menu is used to view alarm history. Under Alarm menu, use left or right key to select Alarm History menu.

```
Alarm
Alarm History
```

Press ENTER from Alarm History menu

```
Alarm History
MAST-CLK DIS 0
```

Alarm History menu shows the alarm history of various type of alarm as shown in Table 3-5. To view alarm history, use left or right arrow key to cycle through and the alarm history is shown. In the above example, the first part MAST-CLK which indicates master clock loss, the second part DIS (disable) shows the current status, and the last part 0 is the total error count.

5.3.3 Alarm Clear Menu

Alarm Clear menu is used to clear alarm queue and history. Under Alarm menu, use left or right key to select Alarm Clear menu.

Press ENTER from Alarm Clear menu. At this menu, press ENTER to confirm clear alarm queue and history. Otherwise press ESC to exit without any action.

5.3.4 Alarm Setup Menu

Alarm Setup menu is used to set up the threshold level of each alarm type as listed in Table 3-5, and enable auto dial out function. Some type of alarm does not have threshold level. Under Alarm menu, use left or right key to select Alarm Setup menu.

5.3.4.1 Alarms Menu

To set up each alarm type as listed in Table 3-5 is similar. Use left and right arrow key to cycle through to select a particular alarm type.

To enable or disable alarm error count, use left and right arrow key to cycle through to a desired selection and press ENTER.

5.3.4.2 Dial-Out Menu

Use left and right arrow key to cycle through to select a particular dial out type.

```
Alarm Setup
Dial Out
```

```
Dial Out
RAI,LINE
```

To enable or disable dial out function when alarm occurs or error count exceed threshold level, use left and right arrow key cycle through to a desired selection and press ENTER.

NOTE: Disabling an alarm reporting automatically disables the modem dial out features, even if these features are individually enabled.

5.3.4.3 Threshold Menu

To setup ES, UAS, CS, and BPV is similar. For example, to setup E1 Line Bipolar Violation threshold level and press ENTER.

```
Alarm Setup
Threshold
```

```
Threshold
BPV,LINE
```

To change threshold level of BPV (or ES, UAS, CSS), use left or right arrow key to cycle through to the digit position, and press ENTER key to cycle through the number. This operation must be concluded by moving left or right arrow key to OK position and press ENTER to enable the changes.

The number inside the parenthesis (5-9) indicates the threshold level of error rate only can change from 10^{-5} to 10^{-9}.

5.3.4.4 Alarm Cut-off Menu

```
Alarm Setup
Alarm Cut-off
```

Press ENTER form the above menu. At this menu, press ENTER to confirm alarm cut-off. Otherwise press ESC to exit without any action.

```
Alarm Cut-off
Confirm?
```

5.4 Performance Menu

Performance group includes Line Status, DTE2 Status, Line Performance, DTE2 Performance, and Reset All Performance.

```
Loop-E 1500-2S
Performance
```

5.4.1 Line Status Menu

Line Status menu is used to view Loop-E E1 line receiver error status report. Under Performance menu, use left or right key to select Line Status menu.

```
Performance
Line Status
```

Press ENTER from Line Status menu.

```
LOS LOF RED
*RAI AIS BPV
```

This menu shows the current error status of line receiver by an ∗. In the above example, line receiver is receiving RAI.

5.4.2 DTE2 Status

Line Status menu is used to view DTE2 line receiver error status report. Under Performance menu, use left or right key to select Line Status menu.

```
Performance
DTE2 Status
```

Press ENTER from Card Status menu.

```
LOS LOF RED
*RAI AIS BPV
```

This menu shows the current error status of line receiver by an ∗. In the above example, line receiver is receiving RAI.

5.4.3 Line Performance Menu

Line Performance menu is used to view Loop-E E1 line receiver performance status report. Under Performance menu, use left or right key to select Line Performance menu.

```
Performance
Line Performance
```

Press ENTER from Line Performance menu.

```
Line Performance
ES:  3
```

Line Performance menu shows the line receiver (user register) of various type of performance status. To view line receiver performance status, use left or right arrow key to cycle through. In the above example, the first part ES which indicates Errored Seconds, the second part 2 is two ES.

5.4.4 DTE2 Performance Menu

Card Performance menu is used to view DTE2 line receiver performance status report. Under Performance menu, use left or right key to select Card Performance menu.

```
Performance
DTE2 Performance
```

Press ENTER from Line Performance menu.

```
DTE2 Performance
ES:  0
```

Line Performance menu shows the line receiver (user register) of various type of performance status. To view line receiver performance status, use left or right arrow key to cycle through. In the above example, the first part ES which indicates Errored Seconds, the second part 2 is two ES.

5.4.5 Reset Performance Menu

Reset Performance menu is used to clear all performance status report. Under Performance menu, use left or right key to select Reset Performance menu.

```
Performance
Reset All Perf.
```

Press ENTER from Reset Performance menu.

```
Reset All Perf.
Confirm ?
```

At this menu, press ENTER to confirm clear all performance status report. Otherwise press ESC to exit without any action.

5.5 Miscellaneous Menu

Miscellaneous menu is used to view Loop-E firmware EPROM version.

```
Loop-E 1500-2S
Miscellaneous
```

```
Miscellaneous
V1.04 04/17/2003
```

6. TERMINAL OPERATIONS

Loop-E 1500 CSU/DSU provides comprehensive report and enhanced configuration capability through the console port. A VT-100 type terminal or a modem can be connected to the console port in the front of Loop-E 1500. Using single-character commands and arrow keys, Loop-E 1500 can be configured and monitored. The single-character command is not case sensitive. On each screen, the available commands and the configurable fields are highlighted. Alarm messages are also sent to the console port and are shown on the top of the screen in blinking mode. Upon Loop-E 1500 power up, a main menu is shown.

NOTE: On the upper right corner of the screen, a time-of-day display indicates the time the current screen is shown. User may press any key other than ESC to update the screen.

NOTE: Only when FDL is FDL or HDLC, far-end operation is accessible.

6.1 Main Menu

6.1.1 For E1 and V.35 interface:

```
LOOP-E E1 CSU/DSU V1.00          === Main Menu ===            16:28:32 08/30/2002

DTE1: V.35
DTE2: E1
[DISPLAY]                                [SETUP]
1     -> 1-Hour Perf./Stat. Report       K     -> V.54 Setup
2     -> 24-Hour Perf./Stat. Report      L     -> Loopback Test
A     -> Line Availability               M     -> Alarm Setup
C     -> System Setup Display            P     -> Password Setup
D     -> System Description              T     -> Change Date and Time
H     -> Alarm History                   S     -> System Setup
I     -> System Status                   V     -> Store Current Configuration
Q     -> Alarm Queue                     R     -> Retrieve Last Stored Configuration
                                         W     -> Send Active DS0-MAP to Far-end
                                         N     -> Synchronize Far-end System Time
                                         G     -> Router Module Setup Menu

[ACCESS]                                 [CLEAR & RESET]
F     -> Log Off [SETUP] and             U     -> Clear Alarm
         [CLEAR & RESET] menu            Y     -> Clear Performance Data
O     -> Log On  [SETUP] and             Z     -> System Reset
         [CLEAR & RESET] menu            B     -> Upgrade System Firmware
                                         X     -> Alarm Cut-off
>>SPACE bar to refresh or enter a command ===>
```

6.1.2 For G.703 (co-directional) interface:

```
LOOP-E E1 CSU/DSU V1.04        === Main Menu ===            14:56:15 04/21/2003
DTE1:    G.703
DTE2:    NO EXIST
[DISPLAY]                                [SETUP]
1     -> 1-Hour Perf./Stat. Report       K     -> V.54 Setup
2     -> 24-Hour Perf./Stat. Report      L     -> Loopback Test
A     -> Line Availability               M     -> Alarm Setup
C     -> System Setup Display            P     -> Password Setup
D     -> System Description              T     -> Change Date and Time
H     -> Alarm History                   S     -> System Setup
I     -> System Status                   V     -> Store Current Configuration
Q     -> Alarm Queue                     R     -> Retrieve Last Stored Configuration
                                         W     -> Send Active DS0-MAP to Far-end
                                         N     -> Synchronize Far-end System Time
                                         G     -> Router Port Setup Menu

[ACCESS]                                 [CLEAR & RESET]
F     -> Log Off [SETUP] and             U     -> Clear Alarm
         [CLEAR & RESET] menu            Y     -> Clear Performance Data
O     -> Log On  [SETUP] and             Z     -> System Reset
         [CLEAR & RESET] menu            B     -> Upgrade System Firmware
                                         X     -> Alarm Cut-off

>>SPACE bar to refresh or enter a command ===>
```

6.1.3 For Router interfaces:

```
LOOP-E E1 CSU/DSU S1.C5        === Main Menu ===            16:23:08 06/19/2003
DTE1:    ROUTER
DTE2:    ROUTER
[DISPLAY]                                [SETUP]
1     -> 1-Hour Perf./Stat. Report       K     -> V.54 Setup
2     -> 24-Hour Perf./Stat. Report      L     -> Loopback Test
A     -> Line Availability               M     -> Alarm Setup
C     -> System Setup Display            P     -> Password Setup
D     -> System Description              T     -> Change Date and Time
H     -> Alarm History                   S     -> System Setup
I     -> System Status                   V     -> Store Current Configuration
Q     -> Alarm Queue                     R     -> Retrieve Last Stored Configuration
                                         W     -> Send Active DS0-MAP to Far-end
                                         N     -> Synchronize Far-end System Time
                                         G     -> Router Port Setup Menu

[ACCESS]                                 [CLEAR & RESET]
F     -> Log Off [SETUP] and             U     -> Clear Alarm
         [CLEAR & RESET] menu            Y     -> Clear Performance Data
O     -> Log On  [SETUP] and             Z     -> System Reset
         [CLEAR & RESET] menu            B     -> Upgrade System Firmware
                                         X     -> Alarm Cut-off

>>SPACE bar to refresh or enter a command ===>
```

If the terminal screen is illegible, press "ENTER" key and "ESC" key alternatively to bring out the main menu. If all efforts fail, check if the right cable is used, and if the console port parameter setting is matched with the terminal using the front panel "Console" command.

The main menu consists of four groups of commands, Display, Access, Setup and Clear & Reset. Initially, only Display and Access commands are available. To enable Setup and Clear commands, user has to log on using "O" command.

6.2 1-Hour Performance/ Statistics Report

To show 1 hour performance report, enter "1". A prompt asking for the type of report is shown at the bottom of the screen. Two choices are available.

```
LOOP-E E1 CSU/DSU V1.00     === 1-Hour Performance Report ===     16:29:24 08/30/2002




>> Select Register Type ? *USER  LINE  FAR-END
```

6.2.1 Performance Report for 1-Hour

Use TAB key to switch performance report and statistics report.

```
LOOP-E E1 CSU/DSU V1.00     === 1-Hour Performance Report ===     16:29:40 08/30/2002
USER
-- Valid Seconds in Current 15-Min Interval : 681 seconds
                                (ES)    (UAS)   (BES)   (SES)   (DM)    (CSS)
   Current 15-Min Interval     : 0       0       0       0       0       0
   1st Nearest 15-Min Interval : 3       0       0       0       0       0
   2nd Nearest 15-Min Interval : 0       0       0       0       0       0
   3rd Nearest 15-Min Interval : -----   -----   -----   -----   -----   -----
   4th Nearest 15-Min Interval : -----   -----   -----   -----   -----   -----

-- Valid 15-Min Intervals in Current 24-Hour Interval: 2
                                (ES)    (UAS)   (BES)   (SES)   (DM)    (CSS)
   Current 24-Hour Interval    : 3       0       0       2       0       1
   08/29/2002                  : -----   -----   -----   -----   -----   -----
   08/28/2002                  : -----   -----   -----   -----   -----   -----
   08/27/2002                  : -----   -----   -----   -----   -----   -----
   08/26/2002                  : -----   -----   -----   -----   -----   -----
   08/25/2002                  : -----   -----   -----   -----   -----   -----
   08/24/2002                  : -----   -----   -----   -----   -----   -----
   08/23/2002                  : -----   -----   -----   -----   -----   -----


<< TAB key to show Statistics Report >>
<< ESC key to return to previous menu, SPACE bar to refresh >>
```

6.2.2 Statistics Report for 1-Hour

Use TAB key to switch performance report and statistics report.

```
LOOP-E E1 CSU/DSU V1.00    === 1-Hour Statistics Report ===      16:29:52 08/30/2002
USER
-- Valid Seconds in Current 15-Min Interval : 693 seconds
                          (%AS)   (%EFS)    (%ES)   (%BES)   (%SES)    (%DM)   (%CSS)
   Current 15-Min       :100.00% 100.00% 0.0000% 0.0000% 0.0000% 0.0000% 0.0000%
   1st Nearest 15-Min   :100.00% 100.00% 0.0000% 0.0000% 0.0000% 0.0000% 0.0000%
   2nd Nearest 15-Min   :100.00% 99.666% 0.3333% 0.0000% 0.2222% 0.0000% 0.3921%
   3rd Nearest 15-Min   :------- ------- ------- ------- ------- ------- -------
   4th Nearest 15-Min   :------- ------- ------- ------- ------- ------- -------

-- Valid 15-Min Intervals in Current 24-Hour Interval: 2
                          (%AS)   (%EFS)    (%ES)   (%BES)   (%SES)    (%DM)   (%CSS)
   Current 24-Hour      :100.00% 99.833% 0.1666% 0.0000% 0.1111% 0.0000% 0.3921%
   08/29/2002           :------- ------- ------- ------- ------- ------- -------
   08/28/2002           :------- ------- ------- ------- ------- ------- -------
   08/27/2002           :------- ------- ------- ------- ------- ------- -------
   08/26/2002           :------- ------- ------- ------- ------- ------- -------
   08/25/2002           :------- ------- ------- ------- ------- ------- -------
   08/24/2002           :------- ------- ------- ------- ------- ------- -------
   08/23/2002           :------- ------- ------- ------- ------- ------- -------


<< TAB key to show Performance Report >>
<< ESC key to return to previous menu, SPACE bar to refresh >>
```

6.3 24-Hour Performance/ Statistics Report

To show the 24 hour performance report, enter "2". A prompt asking for the type of report and performance data is shown at the bottom of the screen. Use cursor keys to select a desired type of report and "Enter↵" key to view the report as follows.

```
LOOP-E E1 CSU/DSU V1.00   === 24-Hour Performance Report ===    16:30:23 08/30/2002



>> Select Register Type ? *USER  LINE  FAR-END
>> Select Parameter ? *ES  UAS  BES  SES  CSS  DM  AS  EFS  BPV
```

6.3.1 Performance Report for 24-Hour

Use TAB key to switch performance report and statistics report.

```
LOOP-E E1 CSU/DSU V1.00   === 24-Hour Performance Report ===    16:31:15 08/30/2002
USER ES
-- Valid Seconds in Current 15-Min Interval : 776 seconds
-- Valid 15-Min Intervals in Current 24-Hour Interval: 2
                              (ES)   (UAS)  (BES)  (SES)  (DM)   (CSS)
   Current 15-Min Interval    : 0      0      0      0      0      0
   Current 24-Hour Interval   : 3      0      0      2      0      1

-- USER, ES, Last 96 15-Min Interval :
   01-08 > 3     0     ----- ----- ----- ----- ----- -----
   09-16 > ----- ----- ----- ----- ----- ----- ----- -----
   17-24 > ----- ----- ----- ----- ----- ----- ----- -----
   25-32 > ----- ----- ----- ----- ----- ----- ----- -----
   33-40 > ----- ----- ----- ----- ----- ----- ----- -----
   41-48 > ----- ----- ----- ----- ----- ----- ----- -----
   49-56 > ----- ----- ----- ----- ----- ----- ----- -----
   57-64 > ----- ----- ----- ----- ----- ----- ----- -----
   65-72 > ----- ----- ----- ----- ----- ----- ----- -----
   73-80 > ----- ----- ----- ----- ----- ----- ----- -----
   81-88 > ----- ----- ----- ----- ----- ----- ----- -----
   89-96 > ----- ----- ----- ----- ----- ----- ----- -----

<< TAB key to show Statistics Report >>
<< ESC key to return to previous menu, SPACE bar to refresh >>
```

6.3.2 Statistics Report for 24-Hour

Use TAB key to switch performance report and statistics report.

```
LOOP-E E1 CSU/DSU V1.00    === 24-Hour Statistics Report ===    16:31:49 08/30/2002
USER %ES
-- Valid Seconds in Current 15-Min Interval : 810 seconds
-- Valid 15-Min Intervals in Current 24-Hour Interval: 2
                          (%ES)  (%UAS)  (%BES)  (%SES)   (%DM)  (%CSS)
   Current 15-Min      :0.0000% 0.0000% 0.0000% 0.0000% 0.0000% 0.0000%
   Current 24-Hour     :0.1666% 0.0000% 0.0000% 0.1111% 0.0000% 0.3921%

-- USER, %ES, Last 96 15-Min Interval :
   01-08 > 0.3333% 0.0000% ------- ------- ------- ------- ------- -------
   09-16 > ------- ------- ------- ------- ------- ------- ------- -------
   17-24 > ------- ------- ------- ------- ------- ------- ------- -------
   25-32 > ------- ------- ------- ------- ------- ------- ------- -------
   33-40 > ------- ------- ------- ------- ------- ------- ------- -------
   41-48 > ------- ------- ------- ------- ------- ------- ------- -------
   49-56 > ------- ------- ------- ------- ------- ------- ------- -------
   57-64 > ------- ------- ------- ------- ------- ------- ------- -------
   65-72 > ------- ------- ------- ------- ------- ------- ------- -------
   73-80 > ------- ------- ------- ------- ------- ------- ------- -------
   81-88 > ------- ------- ------- ------- ------- ------- ------- -------
   89-96 > ------- ------- ------- ------- ------- ------- ------- -------

<< TAB key to show Performance Report >>
<< ESC key to return to previous menu, SPACE bar to refresh >>
```

6.4 Line Availability Report

To show the line availability report, enter "A". The information, based on user performance register set, includes the valid seconds, available seconds, unavailable seconds and line availability

```
LOOP-E E1 CSU/DSU V1.00      === Line Availability ===        16:36:08 08/30/2002

-- Line Availability during Last 24-Hour:
   Valid Seconds      : 2869 seconds
   Available Seconds  : 2869 seconds
   Unavailable Seconds: 0 seconds
   Line Avaliability  : 100.0 %









<< ESC key to return to previous menu, SPACE bar to refresh >>
```

6.5 System Setup Display

Press “C” from the Main Menu to display the system setup screens as below.

6.5.1 For E1 and V.35 interfaces

```
              === Local System Setup(DTE) ===      16:40:19 08/30/2005


LINE=CODE:HDB3 CRC:ON+E RAI:ON   FDL:FDL   IDLE:D5 FRAME:ON   S-BIT:Sa4      CAS:OFF
(E1 )
DTE1=RATE:64K CLOCK:NORMAL    DATA:NORMAL    INTERFACE:V.35
(DTE)   RTS :ACTIVE              TTM :OFF
DTE2 =CODE:HDB3 CRC:ON+E RAI:ON           IDLE:D5 FRAME:ON                 CAS:OFF
(E1 )









<< Press ESC key to return to previous menu >>
```

6.5.2 For G.703 (co-directional) Interface

```
               === Local System Setup(DTE) ===      16:19:44 09/08/2005


LINE=CODE:HDB3 CRC:ON+E RAI:ON   FDL:HDLC IDLE:D5 FRAME:ON   S-BIT:Sa4      CAS:OFF
(E1 )
DTE1 =RATE:64K INTERFACE :G.703
(DTE)









<< Press ESC key to return to previous menu >>
```

6.6 System Description

6.6.1 For V.35 interfaces

```
                          === System Description ===       10:05:16 04/21/2003
LOCAL

Configuration      : DTE1-DTE
Serial Number      : 0
Main Board Version : A
ROM Version        : V1.0 06/23/1997









<< ESC key to return to previous menu, SPACE bar to refresh >>
```

6.6.2 For G.703 (co-directional) Interface

```
                          === System Description ===       10:05:16 04/21/2003
LOCAL

Configuration      : DTE1-G.703
Serial Number      : 0
Main Board Version : A
ROM Version        : V1.04 04/17/2003

<< ESC key to return to previous menu, SPACE bar to refresh >>
```

6.7 Alarm History

Press “H” from the main menu to view alarm history. Use TAB key to view the next page and ESC key to return the previous page.

```
LOOP-E E1 CSU/DSU V1.00       === Alarm History ===          16:36:33 08/30/2002
LOCAL  PAGE-1
[ALARM-TYPE]    [THRESHOLD]    [CURR-STATE]    [COUNT]    [ALARM]    [DIALOUT]
MAST-CLK LOSS                     DISABLE       0         DISABLE    DISABLE
RAI,LINE(E1)                      DISABLE       0         DISABLE    DISABLE
AIS,LINE(E1)                      DISABLE       0         DISABLE    DISABLE
LOS,LINE(E1)                      DISABLE       0         DISABLE    DISABLE
LOF,LINE(E1)                      DISABLE       0         DISABLE    DISABLE
BPV,LINE(E1)       10E-9          OK            0         ENABLE     DISABLE
ES ,LINE(E1)       100            DISABLE       0         DISABLE    ENABLE
UAS,LINE(E1)       100            DISABLE       0         DISABLE    DISABLE
CSS,LINE(E1)       100            DISABLE       0         DISABLE    DISABLE









<< ESC to return , TAB to change page , SPACE to refresh >>
```

```
LOOP-E E1 CSU/DSU V1.00       === Alarm History ===          16:36:50 08/30/2002
LOCAL  PAGE-2
[ALARM-TYPE]    [THRESHOLD]    [CURR-STATE]    [COUNT]    [ALARM]    [DIALOUT]
DTE1 ALARM                        DISABLE       0         DISABLE    DISABLE









<< ESC to return , TAB to change page , SPACE to refresh >>
```

```
LOOP-E E1 CSU/DSU V1.00       === Alarm History ===          16:37:03 08/30/2002
LOCAL  PAGE-3
[ALARM-TYPE]    [THRESHOLD]    [CURR-STATE]    [COUNT]    [ALARM]    [DIALOUT]
RAI,DTE2                          DISABLE       0         DISABLE    DISABLE
AIS,DTE2                          DISABLE       0         DISABLE    DISABLE
LOS,DTE2                          DISABLE       0         DISABLE    DISABLE
LOF,DTE2                          DISABLE       0         DISABLE    DISABLE
BPV,DTE2           10E-5          DISABLE       0         DISABLE    DISABLE
ES ,DTE2           1              DISABLE       0         DISABLE    DISABLE
UAS,DTE2           1              DISABLE       0         DISABLE    DISABLE
CSS,DTE2           1              DISABLE       0         DISABLE    DISABLE









<< ESC to return , TAB to change page , SPACE to refresh >>
```

6.8 System Status

Press “I” from the main menu to display the system status, the screen will show as below.

6.8.1 For V.35 interfaces

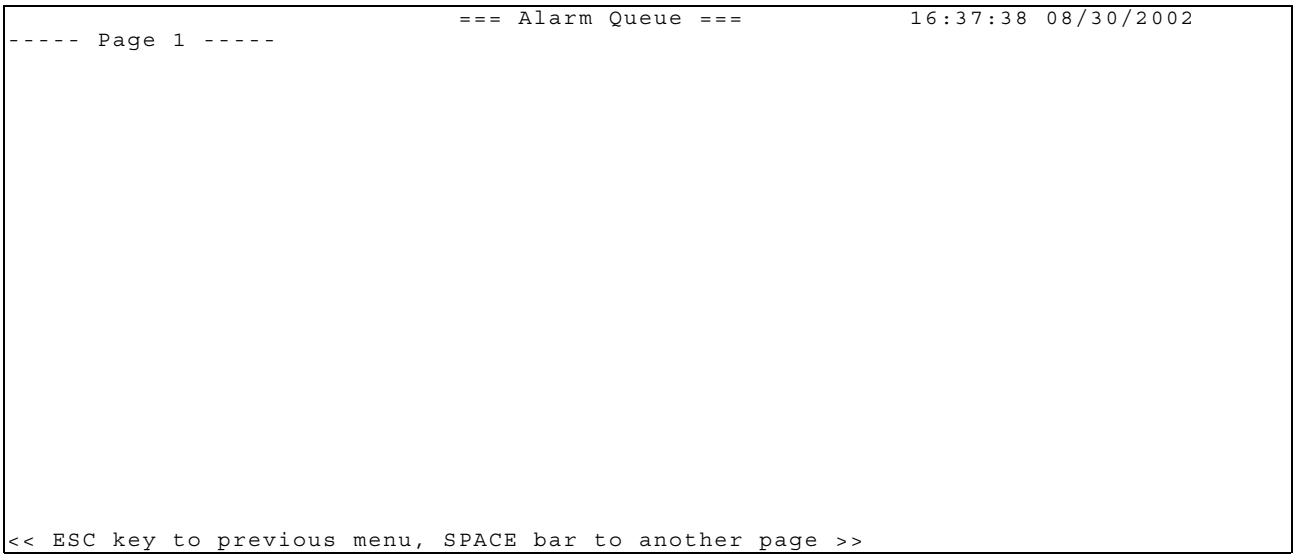
```
LOOP-E E1 CSU/DSU V1.00      === System Status ===          16:37:19 07/04/2005


-- LINE --                              -- TEST --
   LOS      : NO                           PATTERN TRANSMITTED : OFF
   LOF      : NO                           NEAR-END LOOPBACK   : OFF
   RCV AIS  : NO                           DTE1 LOOPBACK       : OFF
   RCV RAI  : NO                           DTE2(E1) LOOPBACK   : OFF
   XMT AIS  : NO
   XMT RAI  : NO                        -- FRAME RELAY --
   BPV ERROR COUNT : 223                   LINK : DOWN         LMI Tx SEQ : 0
   ES  ERROR COUNT : 3                     DLCI : INACTIVE     LMI Rx SEQ : 0

-- DTE1(DTE) --                         -- DTE2(E1) --
   DTE1 RTS LOSS    : YES                  LOS      : NO
   DTE1 CLOCK LOSS : NO                    LOF      : NO
                                           RCV AIS  : NO
                                           RCV RAI  : NO
                                           XMT AIS  : NO
                                           XMT RAI  : NO
                                           BPV ERROR COUNT : 0
                                           ES  ERROR COUNT : 0

<< ESC key to return to previous menu, SPACE bar to refresh >>
```

6.8.2 For G.703 (co-directional) Interface

```
                           === System Status ===          10:08:45 04/21/2003


-- LINE --                              -- TEST --
   LOS      : NO                           PATTERN TRANSMITTED : OFF
   LOF      : NO                           NEAR-END LOOPBACK   : OFF
   RCV AIS  : NO                           DTE1(G.703) LOOPBACK    : OFF
   RCV RAI  : NO
   XMT AIS  : NO
   XMT RAI  : NO                        -- FRAME RELAY --
   BPV ERROR COUNT : 8191                  LINK : DOWN         LMI Tx SEQ : 0
   ES  ERROR COUNT : 1                     DLCI : INACTIVE     LMI Rx SEQ : 0

--DTE1(G.703)--
   DTE1 LOS    : NO









<< ESC key to return to previous menu, SPACE bar to refresh >>
```

6.9 Alarm Queue

Press “Q” from the main menu to display alarm queue.



6.10 V.54 Setup

Press “K” from the main menu to do V.54 setup. A pormpt asking for the type of system setup menu will show up as below. Use TAB key to select the desired option, then press ENTER. The currrent selection will be highlighted by an asterisk (*).

```
LOOP-E E1 CSU/DSU V1.00        === V.54 Setup ===            16:37:51 08/30/2002




>> Select Type ? *LOCAL    FAR-END
>> Select Setup Item ?   *DTE1    DTE2
```

Cursor keys are used to select the field to be changed. As the cursor moves from field to field, the second line on the screen shows the available input for the field. After making all the changes, enter "ESC" key and answer yes to take the change into effect.

```
LOOP-E E1 CSU/DSU V1.00           === V.54 Setup ===            16:38:01 08/30/2002
ARROW KEYS: CURSOR MOVE, TAB: ROLL OPTIONS
LOCAL
[DTE1 V.54 SETUP]
V.54  : ANSI
RL    : ON
LL    : ON









<< Press ESC key to return to previous menu >>
```

NOTE: The V.54 setup function is disable for G.703 (co-directional) interface.

```
                              === V.54 Setup ===            10:09:42 04/21/2003









                        G.703 Card don't support V.54

                      Press ESC key to return MAIN MENU !!
```

6.11 Loopback Test

Press “L” from the main menu to do loopback test, the screen will show up as below.

6.11.1 For V.35 interfaces

```
LOOP-E E1 CSU/DSU V1.00       === Loopback Test ===          16:38:26 08/30/2002
ARROW KEYS : CURSOR MOVE , ENTER KEY : ITEM SELECT

- NEAR-END LOOPBACK   : *OFF  LOCAL  PLB  LLB
- DTE1(DTE)LOOPBACK   : *OFF  TO-DTE  TO-LINE
- DTE2(E1) LOOPBACK   : *OFF  TO-DTE  TO-LINE
- SEND LOOPBACK ACTIVATE CODE TO FAR-END:
        *PAYLOAD  LINE
- SEND LOOPBACK DEACTIVATE CODE TO FAR-END:
        *PAYLOAD  LINE
- SEND CHANNEL LOOPBACK ACTIVATE CODE TO FAR-END:
        *ALL      DTE1    DTE2
- SEND CHANNEL LOOPBACK DEACTIVATE CODE TO FAR-END:
        *ALL      DTE1    DTE2
- SEND V.54 ACTIVATE CODE TO FAR-END:
        *DTE1     DTE2
- SEND V.54 DEACTIVATE CODE TO FAR-END:
        *DTE1     DTE2
- SEND PRBS:
        *OFF  FULL  DTE1  DTE2
- SEND TEST PATTERN:
        *OFF  3-IN-24  1-IN-8  2-IN-8
- STATUS:
<< Press ESC key to return to previous menu >>
```

6.11.2 For G.703 (co-directional) Interface

```
                            === Loopback Test ===          10:10:22 04/21/2003
ARROW KEYS : CURSOR MOVE , ENTER KEY : ITEM SELECT

- NEAR-END LOOPBACK   : *OFF  LOCAL  PLB  LLB
- DTE1(G.703)LOOPBACK : *OFF  TO-DTE  TO-LINE
- SEND LOOPBACK ACTIVATE CODE TO FAR-END:
        *PAYLOAD  LINE
- SEND LOOPBACK DEACTIVATE CODE TO FAR-END:
        *PAYLOAD  LINE
- SEND CHANNEL LOOPBACK ACTIVATE CODE TO FAR-END:
        *ALL      DTE1    DTE2
- SEND CHANNEL LOOPBACK DEACTIVATE CODE TO FAR-END:
        *ALL      DTE1    DTE2
- SEND PRBS:
        *OFF  FULL  DTE1  DTE2
- SEND TEST PATTERN:
        *OFF  3-IN-24  1-IN-8  2-IN-8




- STATUS:
<< Press ESC key to return to previous menu >>
```

6.12 Alarm Setup

Under main menu, press “M” to setup local alarm. Use arrow keys to move the cursor and TAB key to roll options.

6.12.1 For V.35 interfaces

```
LOOP-E E1 CSU/DSU V1.00    === Local Alarm Setup ===        16:38:55 08/30/2002
ARROW KEYS: CURSOR MOVE, TAB: ROLL OPTIONS

[TYPE]    [THRESHOLD] [ALARM] [DIALOUT] [TYPE]    [THRESHOLD] [ALARM] [DIALOUT]
MAST-CLK LOSS         DISABLE DISABLE   RAI,DTE2(E1)          DISABLE DISABLE
RAI,LINE              DISABLE DISABLE   AIS,DTE2(E1)          DISABLE DISABLE
AIS,LINE              DISABLE DISABLE   LOS,DTE2(E1)          DISABLE DISABLE
LOS,LINE              DISABLE DISABLE   LOF,DTE2(E1)          DISABLE DISABLE
LOF,LINE              DISABLE DISABLE   BPV,DTE2(E1) 10E-5    DISABLE DISABLE
BPV,LINE     10E-9    ENABLE  DISABLE   ES ,DTE2(E1)   001    DISABLE DISABLE
ES ,LINE       100    DISABLE ENABLE    UAS,DTE2(E1)   001    DISABLE DISABLE
UAS,LINE       100    DISABLE DISABLE   CSS,DTE2(E1)   001    DISABLE DISABLE
CSS,LINE       100    DISABLE DISABLE
[TYPE]    [THRESHOLD] [ALARM] [DIALOUT]
DTE1 ALARM            DISABLE DISABLE









<< Press ESC key to return to previous menu >>
```

6.12.2 For G.703 (co-directional) Interface

```
                         === Local Alarm Setup ===        10:11:44 04/21/2003
ARROW KEYS: CURSOR MOVE, TAB: ROLL OPTIONS

[TYPE]    [THRESHOLD] [ALARM] [DIALOUT] [TYPE]    [THRESHOLD] [ALARM] [DIALOUT]
MAST-CLK LOSS         DISABLE DISABLE
RAI,LINE              DISABLE DISABLE
AIS,LINE              DISABLE DISABLE
LOS,LINE              DISABLE DISABLE
LOF,LINE              DISABLE DISABLE
BPV,LINE     10E-5    DISABLE DISABLE
ES ,LINE       001    DISABLE DISABLE
UAS,LINE       001    DISABLE DISABLE
CSS,LINE       001    DISABLE DISABLE
[TYPE]    [THRESHOLD] [ALARM] [DIALOUT]
DTE1(G.703) ALM       DISABLE DISABLE









<< Press ESC key to return to previous menu >>
```

6.13 Password Setup

To change the password setup, enter "P" from the main menu.

To enable the password, use TAB key to select "YES". The previous entered password is used. The password itself is not case sensitive. If you want to create your own password, move the cursor at “Change Password”, use TAB key to select "YES", then press ENTER.

```
LOOP-E E1 CSU/DSU V1.00      === Password Setup ===          16:39:10 08/30/2002
ARROW KEYS: CURSOR MOVE, TAB: ROLL OPTIONS


       Enable Password : YES
       Change Password : YES
       Old Password    : XXXX_______
       New Password    : XXXX_______
       Confirm Password: XXXX_______









Save new password ? [Y/N]
```

6.14 Change Date and Time

Enter "T" to change the system date and time. The date and time are shown with the cursor on the hour field. Use the arrow keys to select the field to be changed and enter the correct information.

```
LOOP-E E1 CSU/DSU V1.00     === Date & Time Setup ===         16:39:22 08/30/2002
ARROW KEYS: CURSOR MOVE, Please Input: hh:mm:ss mm/dd/yyyy, BACKSPACE to edit

 Time/Date      :16:39:22 08/30/2002
```

```
<< Press ESC key to return to previous menu >>
```

Press the "Esc" key after making the necessary changes and confirms the changes with "Y". Input is checked for validation. Invalid information is discarded and the original value is shown.

```
>>Save date and time (Y/N)?
```

6.15 System Setup

Press "C" from the main menu to do system setup. A prompt asking for the selection of type and setup group will show up as below. Use arrow keys to select the desired options, press ENTER. The current selection will be highlighted by an asterisk (*).

```
LOOP-E E1 CSU/DSU V1.00       === System Setup ===          16:39:55 08/30/2002




>> Select Setup Group ? *DTE    MAP    SYSTEM
```

6.15.1 DTE – For E1 and V.35 Interfaces

Below is a screen for local port setup. Use arrow keys to move the cursor and TAB key to switch options.

```
                    === Local System Setup(DTE) ===     16:19:18 09/08/2005
ARROW KEYS: CURSOR MOVE, TAB: ROLL OPTIONS


LINE=CODE:HDB3 CRC:ON+E RAI:ON  FDL:HDLC IDLE:D5 FRAME:ON  S-BIT:Sa4     CAS:OFF
(E1 )
DTE1=RATE:64K CLOCK:NORMAL  DATA:NORMAL  INTERFACE: V.35
(DTE) RTS :ACTIVE            TTM :OFF
DTE2=CODE:HDB3 CRC:ON+E RAI:ON          IDLE:D5 FRAME:ON                CAS:OFF
(E1 )









<< Press ESC key to return to previous menu >>
```

6.15.2 DTE – For G.703 (Co-directional) Interface

NOTE: This menu is for display only.

```
                    === Local System Setup(DTE) ===     16:19:18 09/08/2005
ARROW KEYS: CURSOR MOVE, TAB: ROLL OPTIONS

LINE=CODE:HDB3 CRC:ON+E RAI:ON  FDL:FDL  IDLE:D5 FRAME:ON  S-BIT:Sa4     CAS:OFF
(E1 )
DTE1 =RATE:64K INTERFACE:G.703
(DTE)









<< Press ESC key to return to previous menu >>
```

6.15.3 DTE – For Bridge Interface

NOTE: This menu is for display only.

```
                === Local System Setup(DTE) ===      16:19:44 09/08/2005
ARROW KEYS: CURSOR MOVE, TAB: ROLL OPTIONS

LINE=CODE:HDB3 CRC:ON+E RAI:ON  FDL:HDLC IDLE:D5 FRAME:ON  S-BIT:Sa4      CAS:OFF
(E1 )
DTE1 =CODE:HDB3 CRC:ON+E RAI:ON          IDLE:D5 FRAME:ON                 CAS:OFF
(E1 )
DTE2 =Bridge Card









<< Press ESC key to return to previous menu >>
```

6.15.4 MAP – For E1 and V.35 Interfaces

Use cursor keys to select a desired type of report and Enter key to view the report as follows.
Before setting Router module, user should setup active channel MAP first.

NOTE: Channel MAP should not be all idle, at least one channel should be active.

```
LOOP-E E1 CSU/DSU V1.00     === Local System Setup(MAP) ===      16:40:30 08/30/2002
ARROW KEYS: CURSOR MOVE, TAB: ROLL OPTIONS

DS0-MAP     :ACTIVE MAP = SWITCH  CURRENT MAP = MAP1
             MAP1=[miiiiiiiiiii11111111111111111111]
             MAP2=[22222222222222222222222222222222]
             SWITCH TIME = MAP1 00:00-12:00       MAP2 12:00-00:00
             (MAP1)DTE1 20:1280K DTE2  0:   0K
             (MAP2)DTE1  0:   0K DTE2 31:1984K









<< Press ESC key to return to previous menu >>
```

6.15.5 SYSTEM – For E1 and V.35 Interfaces

Below is a screen for local system setup. Use arrow keys to move the cursor and TAB key to switch options.

```
LOOP-E E1 CSU/DSU V1.00   === Local System Setup(SYSTEM) ===   16:40:46 08/30/2002
ARROW KEYS: CURSOR MOVE, TAB: ROLL OPTIONS

[Clock Source Setup]
 MAST-CLOCK:INTERNAL 2nd-CLOCK:INTERNAL CURR-CLOCK : MAST-CLOCK

[Consol Port Setup]
 BAUD:9600  DATA:8-Bits STOP:1-Bit  PAR:NONE XON-XOFF:OFF INTERF:HDLC_PORT

[System Setup]
 DEVICE NAME     : Loop-E 1500-2S
 My IP Address   : 140.132.009.101      Subnet Mask : 000.000.000.000
 Trap IP Address : 255.255.255.255      Gateway IP  : 000.000.000.000
 Community Name  : public

[Inband Loopback Timer Setup]
 Loopback Timer(sec): 00000000

[Frame Relay In-band Setup]
 DLCI: 100  LMI : ITU    CIR : 64     Bc: 64    Be: 64
 T391: 10   N391: 006    N392:  3   N393:  4




<< Press ESC key to return to previous menu >>
```

6.15.6 SYSTEM – For G.703 (Co-directional) Interface

```
                    === Local System Setup(SYSTEM) ===   10:13:14 04/21/2003
ARROW KEYS: CURSOR MOVE, TAB: ROLL OPTIONS

[Clock Source Setup]
 MAST-CLOCK:DTE1(G703) 2nd-CLOCK:LINE       CURR-CLOCK : MAST-CLOCK

[Console Port Setup]
 BAUD:9600  DATA:8-Bits STOP:1-Bit  PAR:NONE XON-XOFF:OFF INTERF:TERMIAL

[System Setup]
 Device Name     : 2s                    Community Name: public
 My IP Address   : 192.168.100.041       Subnet Mask   : 000.000.000.000
 Trap IP Address : 192.168.100.179       Gateway IP    : 192.168.100.039

[Inband Loopback Timer Setup]
 Loopback Timer(sec): 00000000

[Frame Relay In-band Setup]
 DLCI: 100  LMI : ITU    CIR : 64     Bc: 64    Be: 64
 T391: 10   N391: 006    N392:  3   N393:  4



<< Press ESC key to return to previous menu >>
```

6.15.7 SYSTEM – For Router Interface

```
                    === Local System Setup(SYSTEM) ===    10:13:14 04/21/2003
ARROW KEYS: CURSOR MOVE, TAB: ROLL OPTIONS

[Clock Source Setup]
 MAST-CLOCK:DTE1 2nd-CLOCK:LINE       CURR-CLOCK : MAST-CLOCK

[Console Port Setup]
 BAUD:9600  DATA:8-Bits STOP:1-Bit  PAR:NONE XON-XOFF:OFF INTERF:TERMIAL

[System Setup]
 Device Name      : 2s                    Community Name: public
 My IP Address    : 192.168.100.041       Subnet Mask    : 000.000.000.000
 Trap IP Address  : 192.168.100.179       Gateway IP     : 192.168.100.039

[Inband Loopback Timer Setup]             [Inband-Switch]
 Loopback Timer(sec): 00000000             Direction : ROUTER1

[Frame Relay In-band Setup]
 DLCI: 100  LMI : ITU    CIR : 64     Bc: 64    Be: 64
 T391: 10   N391: 006    N392:  3   N393:  4



<< Press ESC key to return to previous menu >>
```

6.16 Store Current Configuration

Press “V” from the main menu to strore the current configuration, then press “Y” or “N” to confirm the setting.

```
>> Store Current Configuration ? [Y/N]
```

6.17 Retrieve Last Stored Configurtion

Press “R” from the main menu to retrieve last strored configuration, then press “Y” or “N” to confirm the retrieve.

```
>> Retrieve Last Stored Configuration ? [Y/N]
```

6.18 Send Active DS0-MAP to Far-end

Press “W” from the main menu to send active DS0 map to farend, then press “Y” or “N” to confirm the setting. Since the notification procedure is implemented in proprietary format, only Loop Telecommunication's CSU/DSU product family would interpret the message correctly. Loop-E has to set FDL to FDL or HDLC to send the active DS0 map to far-end. An "ACK" or "FAIL" is shown depending on whether far-end accept the DS0 map or not.

```
>> Send Active DS0-MAP to Far-end ? [Y/N]
```

6.19 Synchronize Far-end System Time

Press “N” from the main menu to synchronize farend system time, then press “Y” or “N” to confirm it. ue to the time zone difference, hours is not updated by this command. Since the notification procedure is implemented in proprietary format, only Loop Telecommunication's CSU/DSU product family would interpret the message correctly. An "ACK" is shown if the far-end acknowledges this command; otherwise, a "FAIL" is shown.

```
>> Synchronize Far-end System Time ? [Y/N]
```

6.20 Router Module Setup Menu

To setup system for the routher interface, press "G" from the main menu. Move the cursor to select the desired port, Router-1 or Router -2.

```
                        === Router port select ===        14:52:04 08/06/2003


>> Select Port ?  Ruoter-1  *Router-2
```

Then press ENTER from the above screen, the sub-menu of Router module will show up as below.

Screen for the first Router plug-in card:

```
                         === Router-1 Main Menu ===       16:24:52 06/19/2003




                    [--------------- SETUP ---------------]
                      S -> Interface(LAN01-WAN16) Setup
                      A -> Interface(WAN17-WAN32) Setup
                      R -> Route Setup
                      M -> DS0 MAP Setup
                      C -> Ethernet CRC4 Transparency Setup
                      N -> NAT Function Setup
                      D -> Firmware Upgrade


                    [--------------- MISC ---------------]
                      X -> Router Information Summary
                      Y -> Load Default Config
                      Z -> Reset

>> SPACE bar to refresh, or enter a command --->
```

Screen for the second Router plug-in card:

```
                         === Router-2 Main Menu ===       16:25:38 06/19/2003




                    [--------------- SETUP ---------------]
                      S -> Interface(LAN01-WAN16) Setup
                      A -> Interface(WAN17-WAN32) Setup
                      R -> Route Setup
                      M -> DS0 MAP Setup
                      C -> Ethernet CRC4 Transparency Setup
                      N -> NAT Function Setup
                      D -> Firmware Upgrade


                    [--------------- MISC ---------------]
                      X -> Router Information Summary
                      Y -> Load Default Config
                      Z -> Reset

>> SPACE bar to refresh, or enter a command --->
```

6.20.1 Interface (LAN01-WAN16) Setup

Press "S" from the above menu to setup system for LAN to WAN.

Note: To enable NAT function, make sure all RIP I and RIP II are disabled here. See also section 6.20.6.

```
                    === System(LAN1-WAN16) Setup ===     16:26:07 06/19/2003
ARROW KEYS: CURSOR MOVE, Please Input: nnn.nnn.nnn.nnn, BACKSPACE to edit

NI        IPAddress        SubnetMask       Frame     RIP_I    RIP_II   Mode
LAN1      192.168.100.182 255.255.255.000 ETHERNET ENABLE   ENABLE   ROUTE
WAN1      020.001.001.001 255.000.000.000 HDLC     ENABLE   ENABLE   ROUTE
WAN2      000.000.000.000 000.000.000.000 HDLC     DISABLE DISABLE ROUTE
WAN3      000.000.000.000 000.000.000.000 HDLC     DISABLE DISABLE ROUTE
WAN4      000.000.000.000 000.000.000.000 HDLC     DISABLE DISABLE ROUTE
WAN5      000.000.000.000 000.000.000.000 HDLC     DISABLE DISABLE ROUTE
WAN6      000.000.000.000 000.000.000.000 HDLC     DISABLE DISABLE ROUTE
WAN7      000.000.000.000 000.000.000.000 HDLC     DISABLE DISABLE ROUTE
WAN8      000.000.000.000 000.000.000.000 HDLC     DISABLE DISABLE ROUTE
WAN9      000.000.000.000 000.000.000.000 HDLC     DISABLE DISABLE ROUTE
WAN10     000.000.000.000 000.000.000.000 HDLC     DISABLE DISABLE ROUTE
WAN11     000.000.000.000 000.000.000.000 HDLC     DISABLE DISABLE ROUTE
WAN12     000.000.000.000 000.000.000.000 HDLC     DISABLE DISABLE ROUTE
WAN13     000.000.000.000 000.000.000.000 HDLC     DISABLE DISABLE ROUTE
WAN14     000.000.000.000 000.000.000.000 HDLC     DISABLE DISABLE ROUTE
WAN15     000.000.000.000 000.000.000.000 HDLC     DISABLE DISABLE ROUTE
WAN16     000.000.000.000 000.000.000.000 HDLC     DISABLE DISABLE ROUTE


<< Press ESC key to return to previous menu >>
```

6.20.2 Interface (WAN17-WAN32) Setup

```
                    === System(WAN17-WAN32) Setup ===     16:26:50 06/19/2003
ARROW KEYS: CURSOR MOVE, Please Input: nnn.nnn.nnn.nnn, BACKSPACE to edit

NI        IPAddress        SubnetMask       Frame     RIP_I    RIP_II   Mode
WAN17     000.000.000.000 000.000.000.000 HDLC     DISABLE DISABLE ROUTE
WAN18     000.000.000.000 000.000.000.000 HDLC     DISABLE DISABLE ROUTE
WAN19     000.000.000.000 000.000.000.000 HDLC     DISABLE DISABLE ROUTE
WAN20     000.000.000.000 000.000.000.000 HDLC     DISABLE DISABLE ROUTE
WAN21     000.000.000.000 000.000.000.000 HDLC     DISABLE DISABLE ROUTE
WAN22     000.000.000.000 000.000.000.000 HDLC     DISABLE DISABLE ROUTE
WAN23     000.000.000.000 000.000.000.000 HDLC     DISABLE DISABLE ROUTE
WAN24     000.000.000.000 000.000.000.000 HDLC     DISABLE DISABLE ROUTE
WAN25     000.000.000.000 000.000.000.000 HDLC     DISABLE DISABLE ROUTE
WAN26     000.000.000.000 000.000.000.000 HDLC     DISABLE DISABLE ROUTE
WAN27     000.000.000.000 000.000.000.000 HDLC     DISABLE DISABLE ROUTE
WAN28     000.000.000.000 000.000.000.000 HDLC     DISABLE DISABLE ROUTE
WAN29     000.000.000.000 000.000.000.000 HDLC     DISABLE DISABLE ROUTE
WAN30     000.000.000.000 000.000.000.000 HDLC     DISABLE DISABLE ROUTE
WAN31     000.000.000.000 000.000.000.000 HDLC     DISABLE DISABLE ROUTE
WAN32     000.000.000.000 000.000.000.000 HDLC     DISABLE DISABLE ROUTE



<< Press ESC key to return to previous menu >>
```

6.20.3 Router Setup

To setup router module, press "R" from the Router Module Setup menu, then the following screen will show.

```
                        === Router Module Setup ===       16:28:52 06/19/2003
ARROW KEYS: CURSOR MOVE, Please Input: nnn.nnn.nnn.nnn, BACKSPACE to edit

   Net_Address     Netmask         Gateway_Address NI_Address      Metric
   000.000.000.000 000.000.000.000 000.000.000.000 000.000.000.000 01
   000.000.000.000 000.000.000.000 000.000.000.000 000.000.000.000 01
   000.000.000.000 000.000.000.000 000.000.000.000 000.000.000.000 01
   000.000.000.000 000.000.000.000 000.000.000.000 000.000.000.000 01
   000.000.000.000 000.000.000.000 000.000.000.000 000.000.000.000 01
   000.000.000.000 000.000.000.000 000.000.000.000 000.000.000.000 01
   000.000.000.000 000.000.000.000 000.000.000.000 000.000.000.000 01
   000.000.000.000 000.000.000.000 000.000.000.000 000.000.000.000 01
   000.000.000.000 000.000.000.000 000.000.000.000 000.000.000.000 01
   000.000.000.000 000.000.000.000 000.000.000.000 000.000.000.000 01
   000.000.000.000 000.000.000.000 000.000.000.000 000.000.000.000 01
   000.000.000.000 000.000.000.000 000.000.000.000 000.000.000.000 01
   000.000.000.000 000.000.000.000 000.000.000.000 000.000.000.000 01
   000.000.000.000 000.000.000.000 000.000.000.000 000.000.000.000 01
   000.000.000.000 000.000.000.000 000.000.000.000 000.000.000.000 01


<< Press ESC key to return to previous menu >>
```

6.20.4 DS0 MAP Setup

Press "M" from the Router Module Setup menu to seup DS0 map for router interface, then the following screen will show.

```
                        === ROUTER DS0 MAP Setup ===       16:27:50 06/19/2003
ARROW KEYS: CURSOR MOVE, TAB: ROLL OPTIONS

TimeSlot WANPort         TimeSlot WANPort
TS1  :   WAN32           TS17 :   Idle
TS2  :   Idle            TS18 :   Idle
TS3  :   Idle            TS19 :   Idle
TS4  :   Idle            TS20 :   Idle
TS5  :   Idle            TS21 :   Idle
TS6  :   Idle            TS22 :   Idle
TS7  :   Idle            TS23 :   Idle
TS8  :   Idle            TS24 :   Idle
TS9  :   Idle            TS25 :   Idle
TS10 :   Idle            TS26 :   Idle
TS11 :   Idle            TS27 :   Idle
TS12 :   Idle            TS28 :   Idle
TS13 :   Idle            TS29 :   Idle
TS14 :   Idle            TS30 :   Idle
TS15 :   Idle            TS31 :   Idle
TS16 :   Idle            TS32 :   Idle


<< Press ESC key to return to previous menu >>
```

6.20.5 Ethernet CRC4 Transparency Setup

Press "C" from the Router Module Setup menu to enable or disable Ethernet CRC4 transparency router interface, then the following screen will show.

Note that this function is available only for over version 2.00.

```
                    === Ethernet CRC4 Transparency Setup ===16:29:27 06/19/2003
ARROW KEYS: CURSOR MOVE, TAB: ROLL OPTIONS


   Enable Ethernet CRC4 Transparency over HDLC in Bridge Mode : NO









<< Press ESC key to return to previous menu >>
```

6.20.6 NAT Function Setup

Press “N” from the Router Main Menu to setup NAT function, as the following screen shows. Enable or disable NAT function by using TAB key.

Note: Before enabling NAT, you should confirm LAN-IP & LAN-MASK belonging to the private address space and make sure all RIP I and RIP II are disabled. See also section 6.20.1.

```
                          === NAT Function Setup ===       16:30:10 06/19/2003
ARROW KEYS: CURSOR MOVE, TAB: ROLL OPTIONS


   NAT Function : DISABLE



 Note:  Before enabling NAT, you should confirm LAN-IP & LAN-MASK
        belonging to the private address space !!!

 Note:  NAT only support single-wan at WAN01









<< Press ESC key to return to previous menu >>
```

6.20.7 Firmware Upgrade

Press "D" from the Router Module Setup menu to download firmware, then the screen will show as below.

```
                          === Download Firmware ===        16:30:39 06/19/2003
ARROW KEYS: CURSOR MOVE, Please Input: nnn.nnn.nnn.nnn, BACKSPACE to edit




Current Software Downloading...: ROUTER!!
TFTP Server IP       : 000.000.000.000
Firmware File Name   :









<< Press ESC key to return to previous menu >>
```

6.20.8 Router Information Summary

Press “X” from the Router module main menu to display the summary of Router information as below screen shows.

```
                    === Router Information Summary ===   16:31:08 06/19/2003


 Router S/W Version         : S3.C3 04/22/2003
 Router Start Up time/date  : 16:22:02 06/19/2003
 Router Shot Down time/date: 16:24:50 06/19/2003

 --- Link Status(Multi-Wan Port) ---
 LAN Interface Link Status : UP
 WAN Interface Link Status : UP
     WAN 1: UP      WAN 2: NO_USE  WAN 3: NO_USE  WAN 4: NO_USE
     WAN 5: NO_USE  WAN 6: NO_USE  WAN 7: NO_USE  WAN 8: NO_USE
     WAN 9: NO_USE  WAN10: NO_USE  WAN11: NO_USE  WAN12: NO_USE
     WAN13: NO_USE  WAN14: NO_USE  WAN15: NO_USE  WAN16: NO_USE
     WAN17: NO_USE  WAN18: NO_USE  WAN19: NO_USE  WAN20: NO_USE
     WAN21: NO_USE  WAN22: NO_USE  WAN23: NO_USE  WAN24: NO_USE
     WAN25: NO_USE  WAN26: NO_USE  WAN27: NO_USE  WAN28: NO_USE
     WAN29: NO_USE  WAN30: NO_USE  WAN31: NO_USE  WAN32: NO_USE




<< Press ESC key to return to previous menu >>
```

6.20.9 Load Default Configuration

Press "Y" from the Router Module Setup menu to return to default, then the following screen will show. Press "Y" or "N" to confirm the selection, then key in the default password, LOOP. To change password, press "P" from the main menu for router interface.

```
>> Return to default - are you sure ? [Y/N]
==>> Enter password : XXXX
```

6.20.10 Reset

To enable the latest Router configuration, press "Z" from the Router Module Setup menu to reset the system for router interface, then the following screen will show. Press "Y" or "N" to confirm the selection, then key in the default password, LOOP. To change password, press "P" from the main menu for router interface.

```
Reset - are you sure ? [Y/N]

==>> Enter password : XXXX
```

After pressing ENTER from the above screen, the following screen will display.

```
                    Begin to reboot the router!

         It'll take several seconds to resume the module, Please wait...
```

6.21 Clear Alarm

Press “U” from the main menu to clear alarm, then press “Y” or “N” to confirm it.

```
>> Clear Alarm ? [Y/N]
```

6.22 Clear Performance Data

Press “Y” from the main menu to clear performance data, then move the cursor to select the desired type, LOCAL or FAR-END, press ENTER. The currrent selection will be highlighted by an asterisk (*). After done the type selection, press “Y” or “N” to confirm the setting.

```
>> Select Type?  *LOCAL   FAR-END
>> Clear Performance data ? [Y/N]
```

6.23 System Reset

Press “Z” from the main menu to reset the system, then press “Y” or “N” to confirm it. Upon this command, system will restart from init routine and perform all power-up diagnostics procedures. System will prompt the following message and user must enter a valid password to execute this command. The default password is LOOP.

```
Reset - are you sure ? [Y/N]
```

6.24 Upgrade System Firmware

Press “B” from the main menu to upgrade system firmware, then the sub-menu of file transfer will show up as below.

```
LOOP-E E1 CSU/DSU V1.00      === File Transfer ===          16:49:19 08/30/2002


                    A -> Download Mainboard Firmware(TFTP)
                    B -> Zmodem Download Mainboard Firmware









>>SPACE bar to refresh or enter a command ===>
```

Press “A” from the above menu to download firmware, the following screen will show up.

```
LOOP-E E1 CSU/DSU V1.00   === Download Firmware ===        16:49:51 08/30/2002
ARROW KEYS: CURSOR MOVE, Please Input: nnn.nnn.nnn.nnn, BACKSPACE to edit

Firmware 1 Version    : S1.A0 08/28/2002
Firmware 2 Version    : S1.A0 08/28/2002
Current Firmware Bank: 1
Next Boot Firmware    : 1
TFTP Server IP        : 000.000.000.000
Firmware File Name    :









<< Press ESC key to return to previous menu >>
```

6.25 Alarm Cut-off

Press “X” from the main menu to cut off all alarms, then press “Y” or “N” to confirm the setting.

```
>> Cut off alarm - are you sure (Y/N)?
```

6.26 Logoff

After completing the system setup or clear history data, user should log off to prevent accidentally changing the system configuration. Enter "F" to Logoff.

6.27 Logon

To show a full menu, user has to Logon. If the password option is turned on, a prompt asking for password is shown.

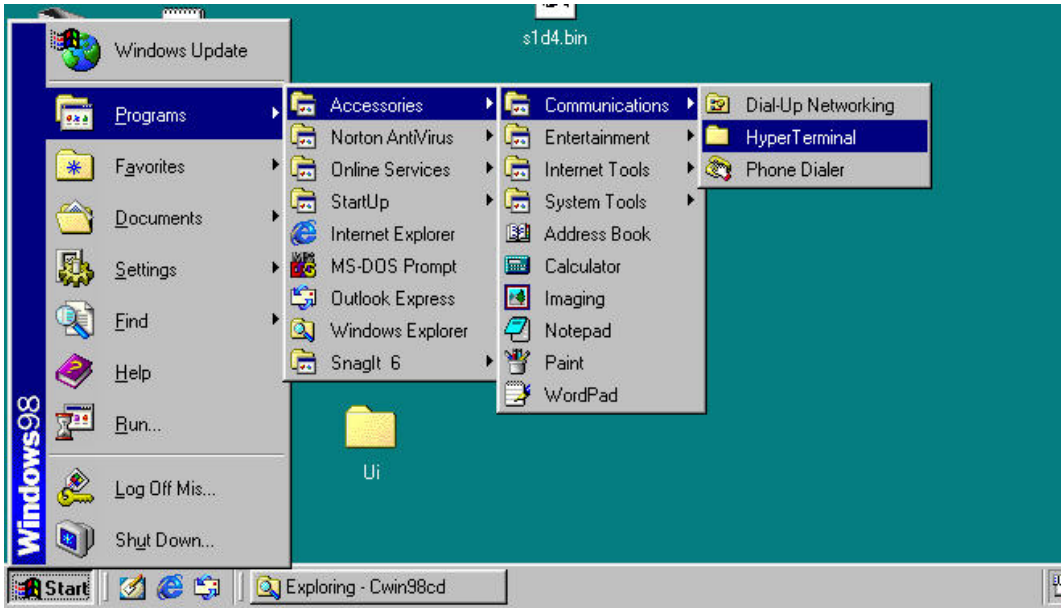
```
==>> Enter Password ?
```

Only after a valid password is entered, the full menu is shown, otherwise user is asked to enter the correct password again.

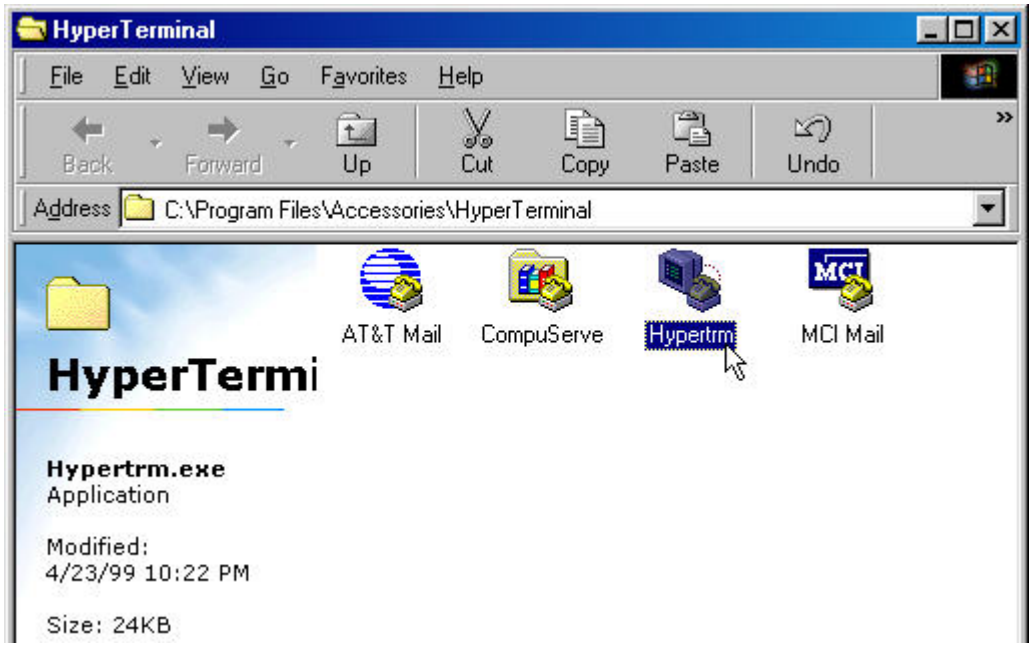
```
>>Invalid input of password ! Try again [Y/N]?
```

7. APPENDIX A: Upgrade Firmware Procedure

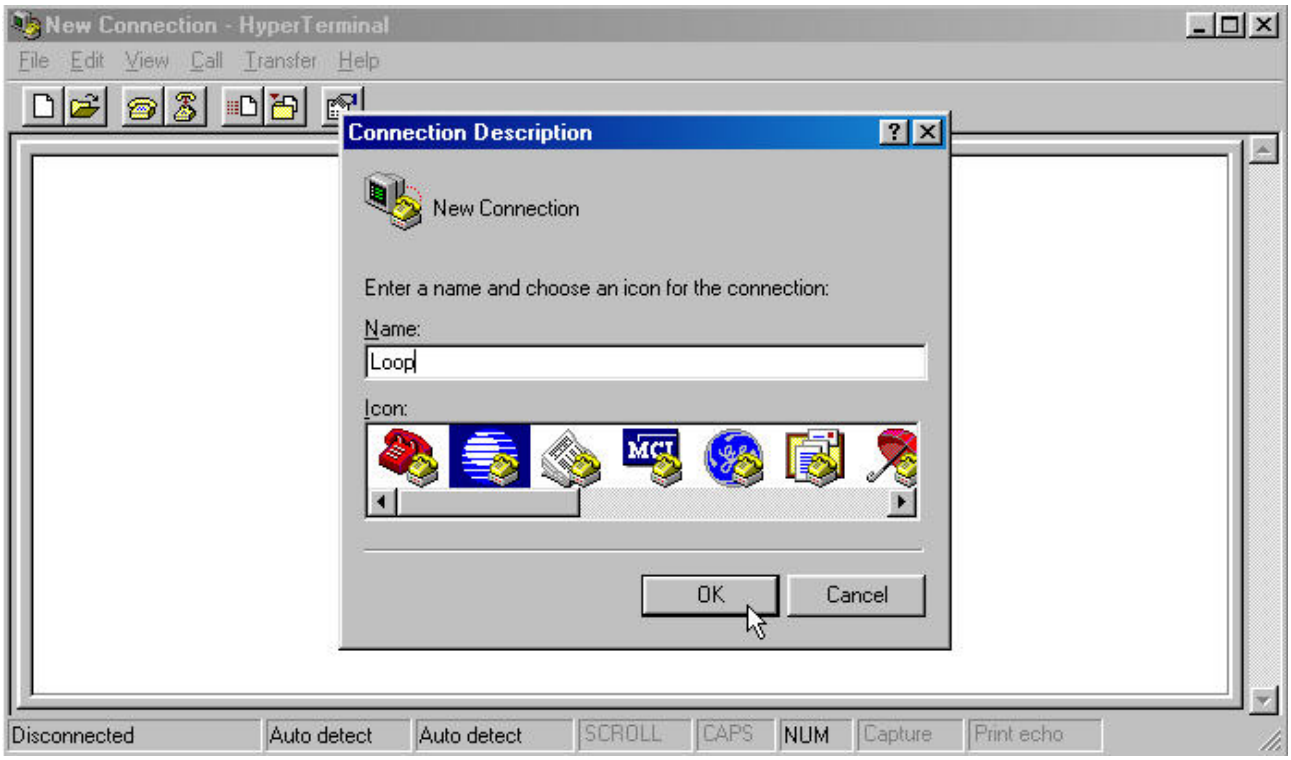
Move the cursor at [Start] with a click to select [Hyper Terminal] by the following path, [Programs] → [Accessories] → [Communication] → [Hyper Terminal].



As the below screen shows up, move the cursor at the icon of Hypertrm.

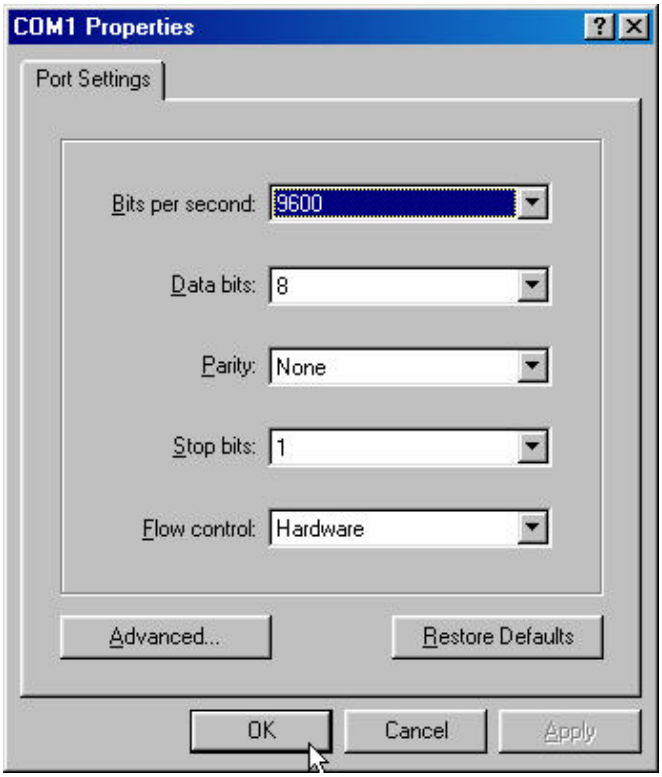


Double clicks to from the above screen, the following screen will show up with a dialog box. Key in a connection name and select a desired icon, then press OK.



After done the setting for Com port connection, press OK.

Move the cursor to select desired options for COM1 properties. Make sure that the COM1 setting is same as the RS232-port setting.



Two ways for checking the default setting of RS232-port: (1) For VT100 terminal operation, press “S” from the main menu to enter in the “System Setup” menu,

When the setting of COM1 properties is complete, the following screen will show up.

```
LOOP-E E1 CSU/DSU V1.00      === Main Menu ===            16:28:32 08/30/2002
DTE1: V.35
DTE2: E1
[DISPLAY]                                [SETUP]
1     -> 1-Hour Perf./Stat. Report
2     -> 24-Hour Perf./Stat. Report
A     -> Line Availability
C     -> System Setup Display
D     -> System Description
H     -> Alarm History
I     -> System Status
Q     -> Alarm Queue




[ACCESS]                                 [CLEAR & RESET]
F     -> Log Off [SETUP] and
         [CLEAR & RESET] menu
O     -> Log On  [SETUP] and
         [CLEAR & RESET] menu

>>Enter Password:
```

Press “O” from the above screen, then the screen will show as below.

```
LOOP-E E1 CSU/DSU V1.00      === Main Menu ===            16:28:32 08/30/2002
DTE1: V.35
DTE2: E1
[DISPLAY]                                [SETUP]
1     -> 1-Hour Perf./Stat. Report       K     -> V.54 Setup
2     -> 24-Hour Perf./Stat. Report      L     -> Loopback Test
A     -> Line Availability               M     -> Alarm Setup
C     -> System Setup Display            P     -> Password Setup
D     -> System Description              T     -> Change Date and Time
H     -> Alarm History                   S     -> System Setup
I     -> System Status                   V     -> Store Current Configuration
Q     -> Alarm Queue                     R     -> Retrieve Last Stored Configuration
                                         W     -> Send Active DS0-MAP to Far-end
                                         N     -> Synchronize Far-end System Time
                                         G     -> Router Module Setup Menu

[ACCESS]                                 [CLEAR & RESET]
F     -> Log Off [SETUP] and             U     -> Clear Alarm
         [CLEAR & RESET] menu            Y     -> Clear Performance Data
O     -> Log On  [SETUP] and             Z     -> System Reset
         [CLEAR & RESET] menu            B     -> Upgrade System Firmware
                                         X     -> Alarm Cut-off
>>SPACE bar to refresh or enter a command ===>
```

Press “B” from the above menu, the sub-menu of file transfer will show as below.

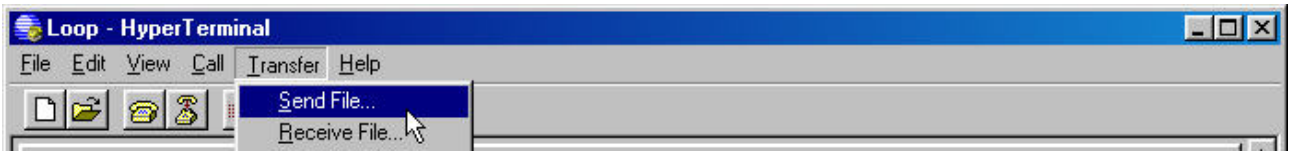
```
LOOP-E E1 CSU/DSU V1.00      === File Transfer ===          16:49:19 08/30/2002



                    A -> TFTP Download Mainboard Firmware
                    B -> ZMODEM Download Mainboard Firmware









>>SPACE bar to refresh or enter a command ===>
```

Press “A” from the above menu to download firmware, the following screen will show up.

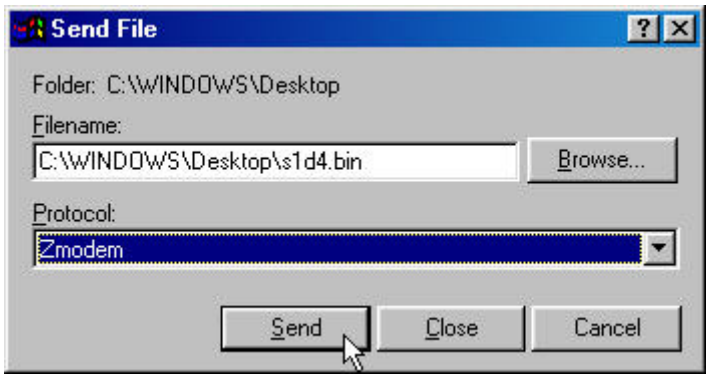
```
                          === Download Firmware ===        16:49:51 08/30/2002
ARROW KEYS: CURSOR MOVE, BACKSPACE to edit, ESC to abort

Firmware 1 Version    : V1.05 05/23/2003
Firmware 2 Version    : S1.A6 05/29/2003
Current Firmware Bank: 1
Next Boot Firmware    : 1
TFTP Server IP        : 140.132.002.027
Firmware File Name    : l500_2s.run


           11:22:18 06/23/03  Downloading firmware ...Recieved     41 Blocks









<< Press ESC key to return to previous menu >>
```

```
                          === Download Firmware ===        11:22:09 06/23/2003
ARROW KEYS: CURSOR MOVE, BACKSPACE to edit, ESC to abort

Firmware 1 Version    : V1.05 05/23/2003
Firmware 2 Version    : S1.A6 05/29/2003
Current Firmware Bank: 1
Next Boot Firmware    : 1
TFTP Server IP        : 140.132.002.027
Firmware File Name    : l500_2s.run


           11:22:18 06/23/03  Downloading firmware ...Recieved    947 Blocks
           11:24:25 06/23/03  check sum ok
           11:24:25 06/23/03  Next boot firmware switch to bank 2.
           11:24:25 06/23/03  Received 485283 bytes in 128 seconds









<< Press ESC key to continue >>
```

When the above screen shows up, move the cursor to select [Send File] of [Transfer], then click it.

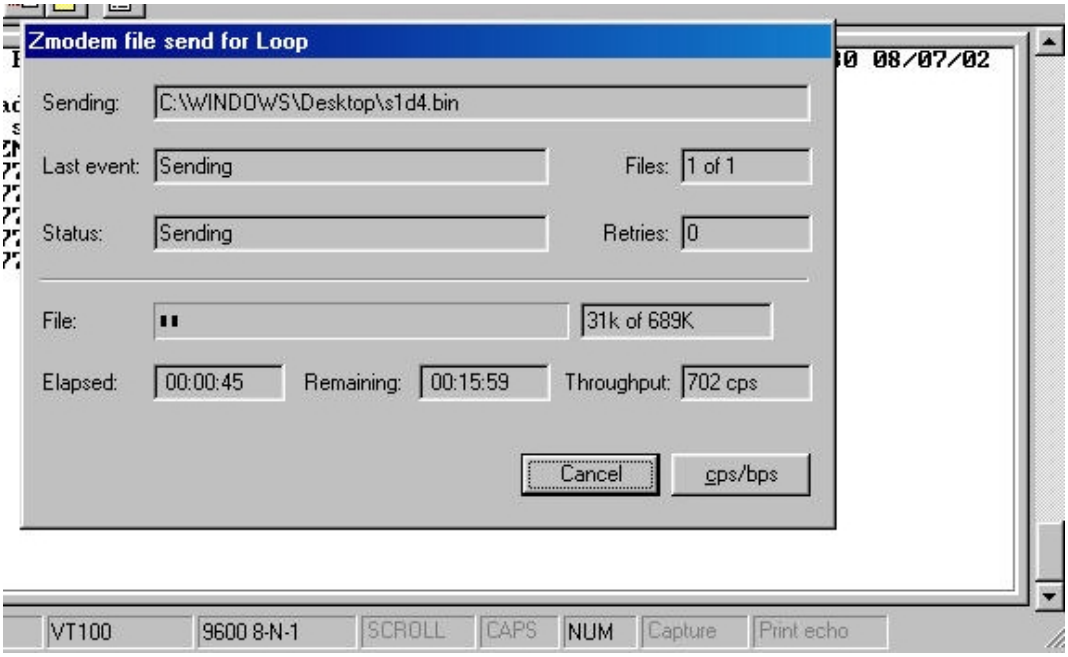


As the below dialog box shows up, move the cursor to select the desired direction and filename. Press the bottom of Send.

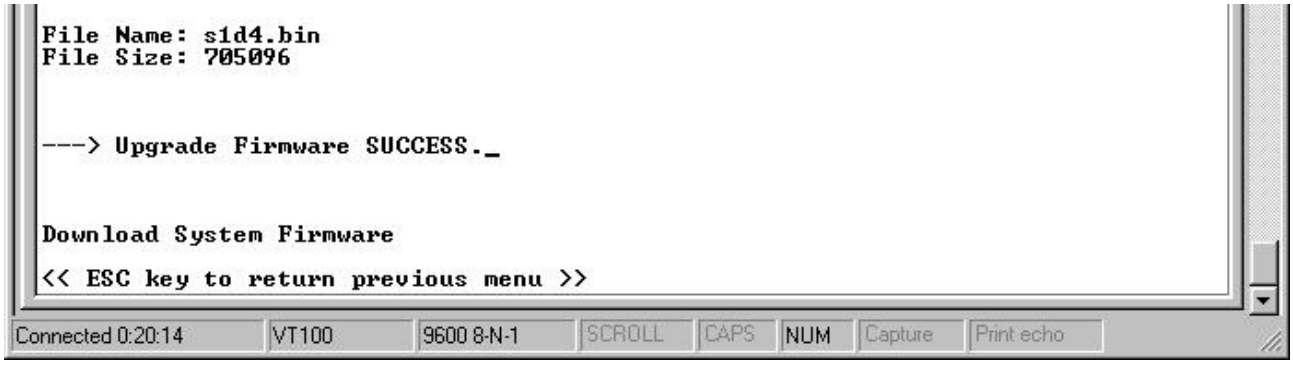


Then the system will show up the status of sending file as below shows. Note that this process will take 15 minutes.

NOTE:	During upgrade process, do not perform any other function until upgrade firmware is complete. Else the process will fail and system crash.



When the upgrade firmware is complete, the screen will show up with a message, Upgrade Firmware SUCCESS, as below.



Press ESC key from the above menu to return the following Main Menu. Press “Z” to reset the system.

```
LOOP-E E1 CSU/DSU V1.00      === Main Menu ===            16:28:32 08/30/2002
DTE1: V.35
DTE2: E1
[DISPLAY]                                [SETUP]
1     -> 1-Hour Perf./Stat. Report       K     -> V.54 Setup
2     -> 24-Hour Perf./Stat. Report      L     -> Loopback Test
A     -> Line Availability               M     -> Alarm Setup
C     -> System Setup Display            P     -> Password Setup
D     -> System Description              T     -> Change Date and Time
H     -> Alarm History                   S     -> System Setup
I     -> System Status                   V     -> Store Current Configuration
Q     -> Alarm Queue                     R     -> Retrieve Last Stored Configuration
                                         W     -> Send Active DS0-MAP to Far-end
                                         N     -> Synchronize Far-end System Time
                                         G     -> Router Module Setup Menu

[ACCESS]                                 [CLEAR & RESET]
F     -> Log Off [SETUP] and             U     -> Clear Alarm
         [CLEAR & RESET] menu            Y     -> Clear Performance Data
O     -> Log On  [SETUP] and             Z     -> System Reset
         [CLEAR & RESET] menu            B     -> Upgrade System Firmware
                                         X     -> Alarm Cut-off
Reset - are you sure ? [Y/N]
```

From the above menu, press “Y” to confirm the reset. The system will prompt a request to enter password as below shows. The default password is LOOP.

```
===>Enter password:
```

The system will be started to reset after pressing ENTER from the above menu.

```
System Reseting...
```

Note that if user wants to make the setting of BANK1 equal to the setting of BANK2, repeat the whole procedure for BANK1.

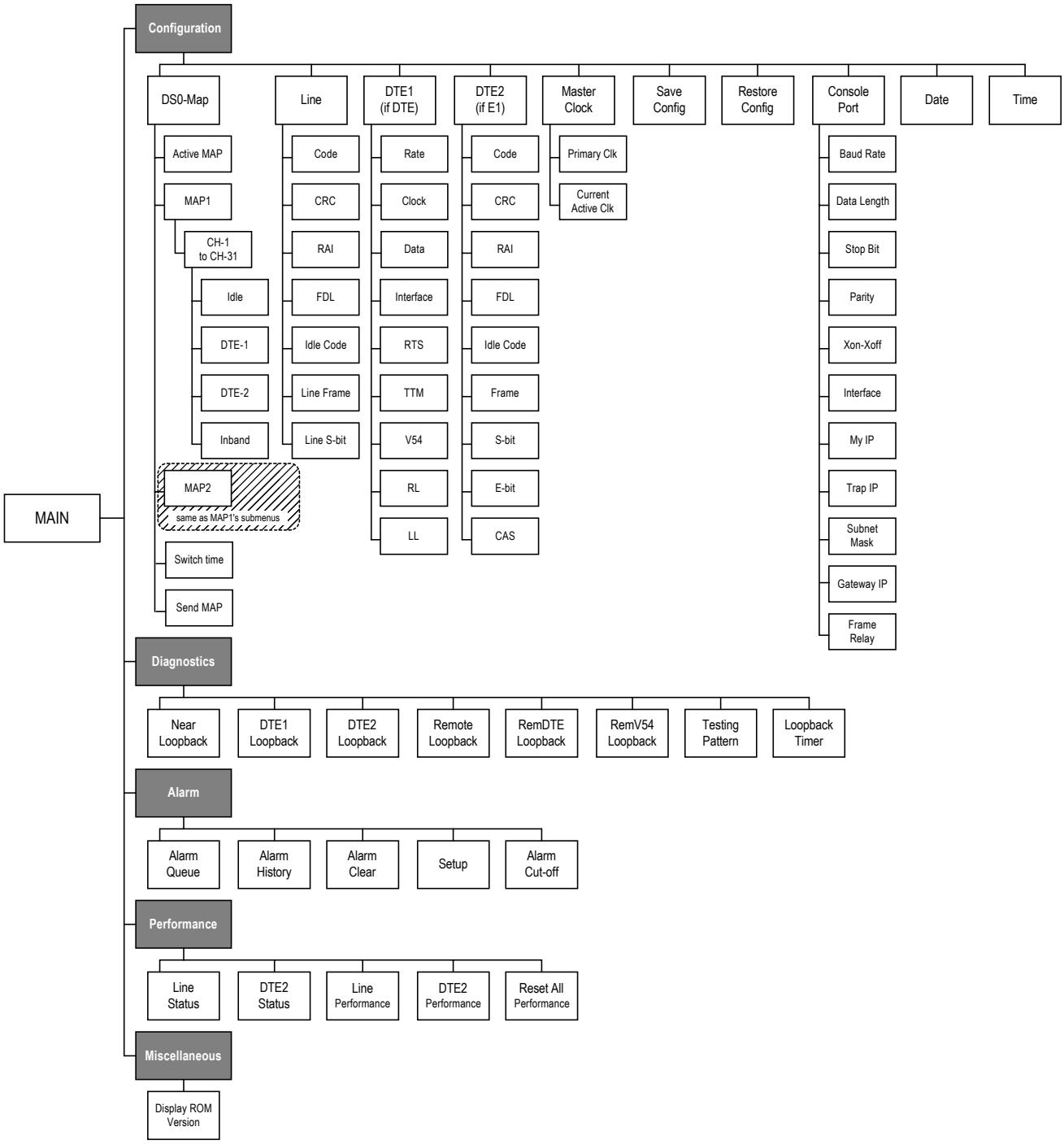
8. APPENDIX B: PRBS (Pseudo-Random Bit Sequence)

PRBS (Pseudo-Random Bit Sequence) is defined in ITU G.732, consists of a 15-stage shift register that generates every combination of 15-bit words, repeats every 32767 bits.

The pattern is generated in a 15-stage register whose 14th and 15th stage outputs are added in a modulo-two addition stage, and the result fed back to the input of the first stage.

This test pattern can be used in conjunction with local loopback to test local Loop-E E1 CSU/DSU integrity. It can also be used in conjunction with remote loopback to test remote Loop-E E1 CSU/DSU and E1 network line quality.

9. APPENDIX C: LCD Menu Tree



10. APPENDIX D: Glossary of Abbreviations

A

AIS	Alarm Indication Signal
AMI	Alternate Mark Inverting
ANSI	American National Standards Institute

B

BPV	Bipolar Violation

C

CSU	Channel Service Unit
CTS	Clear to Send

D

D&I	Drop and Insert
DACS	Digital Access Cross-Connect System
DSR	Data Set Ready
DSU	Data Service Unit
DTE	Data Terminal Equipment
DTR	Data Terminal Ready

H

HDB3	High Density bipolar of order 3

L

LAN	Local Area Network
LLB	Line Loopback
LOFS	Loss of Frame Sync
LOS	Loss of Signal

N

NI	Network Interface

O

OOF	Out of Frame

P

PBX	Private Branch Exchanges
PLB	Payload Loopback
PLL	Phase Lock Loop
PRBS	Pseudo-Random Bit Sequence

R

RAI	Remote Alarm Indicator
RTC	Real Time Clock
RTS	Request to Send

S

SNMP	Simplified Network Management Protocol

T

TE	Terminal Equipment
TTM	Terminal Timing Mode

W

WAN	Wide Area Network